1968

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ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
BRISTOL BAY AREA

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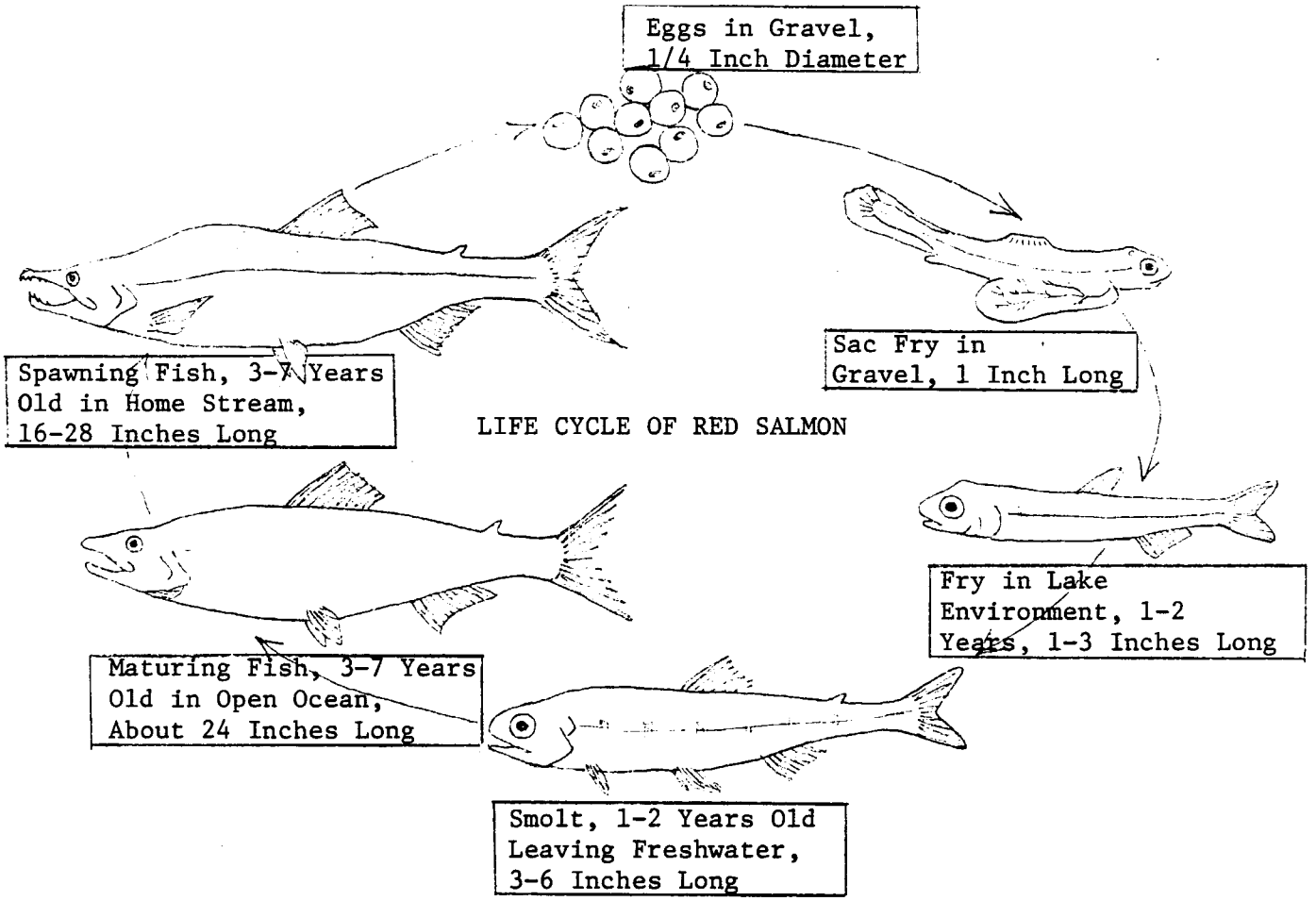
ANNUAL MANAGEMENT REPORT

-1968-



Compiled by Bristol Bay Area Staff
Anchorage, Alaska
May 28, 1969

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PREFACE

Data in the 1968 Annual Management Report supercedes information presented in previous management reports. Errors have been corrected whenever found. Previously un-recorded data have been incorporated into this report with all preliminary data which is so indicated by appropriate footnotes.

In an effort to increase the ease with which this report may be used for reference, the data has been divided between current year tables (1968) and comparative appendix tables (1951-68). A table of contents is included for a reference guide to the entire report, as well as a literature cited section, which is coded to the comparative appendix tables.

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INTRODUCTION

The inshore run of red salmon to Bristol Bay in 1968 was 8,010,000, while the Department's pre-season inshore forecast placed the total run at 10,444,000 red salmon (Tables 1 and 2). A similar inshore run of 10,500,000 was forecast by the Fisheries Research Institute of the University of Washington based on purse seine sampling of immature red salmon south of Adak in the Aleutian Island chain. The actual inshore run, therefore, fell 23% below the Department's pre-season forecast. A forecast accuracy of plus or minus 25% is considered usable in the management of the Bristol Bay red salmon fisheries.

Further, the pre-season forecast of ocean age composition of the two major age groups proved accurate, which when compared with offshore test fishing results in 1968, gave the Department an early indication of the age composition, and provided a check on the accuracy of the forecast prior to arrival of the main body of the fish in the Bay.

Forecast accuracy for individual river systems within each district usually vary considerably, and 1968 was no exception. The red salmon return to the Naknek-Kvichak district was larger than forecast, while the runs to the other four districts were smaller than anticipated (Table 2). Final catch of the Japanese high seas fishery of Bristol Bay mature and immature red salmon was 921,000 and 880,000 fish respectively (Appendix Tables 20 and 21). The immature catch would be expected to return to Bristol Bay in 1969.

In anticipation of a poor run to the Kvichak River, the Board of Fish and Game adopted a staff proposal for complete closure during the emergency order period. However, the Kvichak run exceeded expectations, and an excellent off-cycle escapement of 2,557,000 reds was realized, one and one-half time higher than the average off-cycle escapement of 1,888,000, since 1955.

Escapement goals for 1968 were set at 5,751,000 based on a forecasted run of 10,444,000 red salmon (Table 2). The total Bristol Bay red salmon escapement totaled 5,217,000, and only in the Egegik district was the escapement considered to be below desired minimum requirements when viewed with the total district run (Appendix Table 14). Although not as significant as the early run timing in 1967, the 1968 red run was also earlier than normal. This was especially true for the Igushik River red salmon stocks

of the Nushagak district and the Egegik district red salmon run. The Bristol Bay red salmon catch and escapement by district for 1968 is graphically presented in Figure 1; while the commercial catch by species is compared to the average catch in Figure 2.

In an attempt to control the increase in salmon net gear in the waters of Alaska, the Board of Fish and Game adopted for 1968 the following regulations pertaining to Alaska salmon net gear licenses: Eligibility to fish in 1968 was dependent upon (a) prior licensing - those persons previously fishing in 1965, 1966 or 1967 could purchase a salmon net gear license for 1968; (b) hardship - several factors including military service, investment in vessels and gear, sickness and/or death and new developing fisheries were in force and anyone meeting one of these conditions was allowed a salmon net gear license; and (c) new entry - those persons not qualifying under (a) and (b) above were placed in the new entry category, which authorized issuance of licenses to new entrants not to exceed 3% of the average number of salmon net gear licenses issued annually between January 1, 1960 and December 31, 1967. Bristol Bay was allowed 67 new salmon net gear licenses under the new entry provision.

The legality of the 1968 gear limiting regulation was contested in the U. S. District Court in Anchorage by four fishermen who were denied salmon net gear licenses in 1968. The Court ruled in favor of the plaintiffs on the grounds that the gear regulation was unconstitutional and violated both the U.S. and Alaska Constitutions.

Gear registration in 1968 was almost identical to the amount registered in 1967 (Appendix Table 1). The number of commercial drift and set nets registered for Bristol Bay from 1930 through 1968 is shown in Figure 3, which graphically depicts the increase in effort, especially since 1960. In an attempt to further discourage participation and reduce fishing effort in the fishery, the Board of Fish and Game adopted a sliding gear scale in 1968, which allowed drift fishermen 75 fathoms of gear and set netters 25 fathoms, or half of what was previously allowed in the fishery. The reduced gear was in effect for the entire season escept in the Nushagak district where it became necessary to increase the gear per fisherman to adequately harvest the large run of pink salmon to that district. Mobile drift gill net gear continued to account for the majority of the fish taken in Bristol Bay (Figure 4 and Appendix Table 8).

Even though the Bristol Bay commercial salmon case pack was valued at $12,467,000 and the fishermen received approximately $4,693,000 for their catches, the reduced harvest coupled with excessive gear resulted in the Bristol Bay area being designated as a Disaster Area (Appendix Tables 10 and 12). For the second consecutive year Federal and State funds were utilized to help offset the severe economic effects on the local economy.

There were eight operating shore canneries processing salmon in 1968, two less than in 1967. Additionally, there was one canning ship, four freezer ships and nine operators salting, or marketing fresh salmon during the season. Future years will probably continue to show an increase in the production of fresh-frozen and salted fish in Bristol Bay.

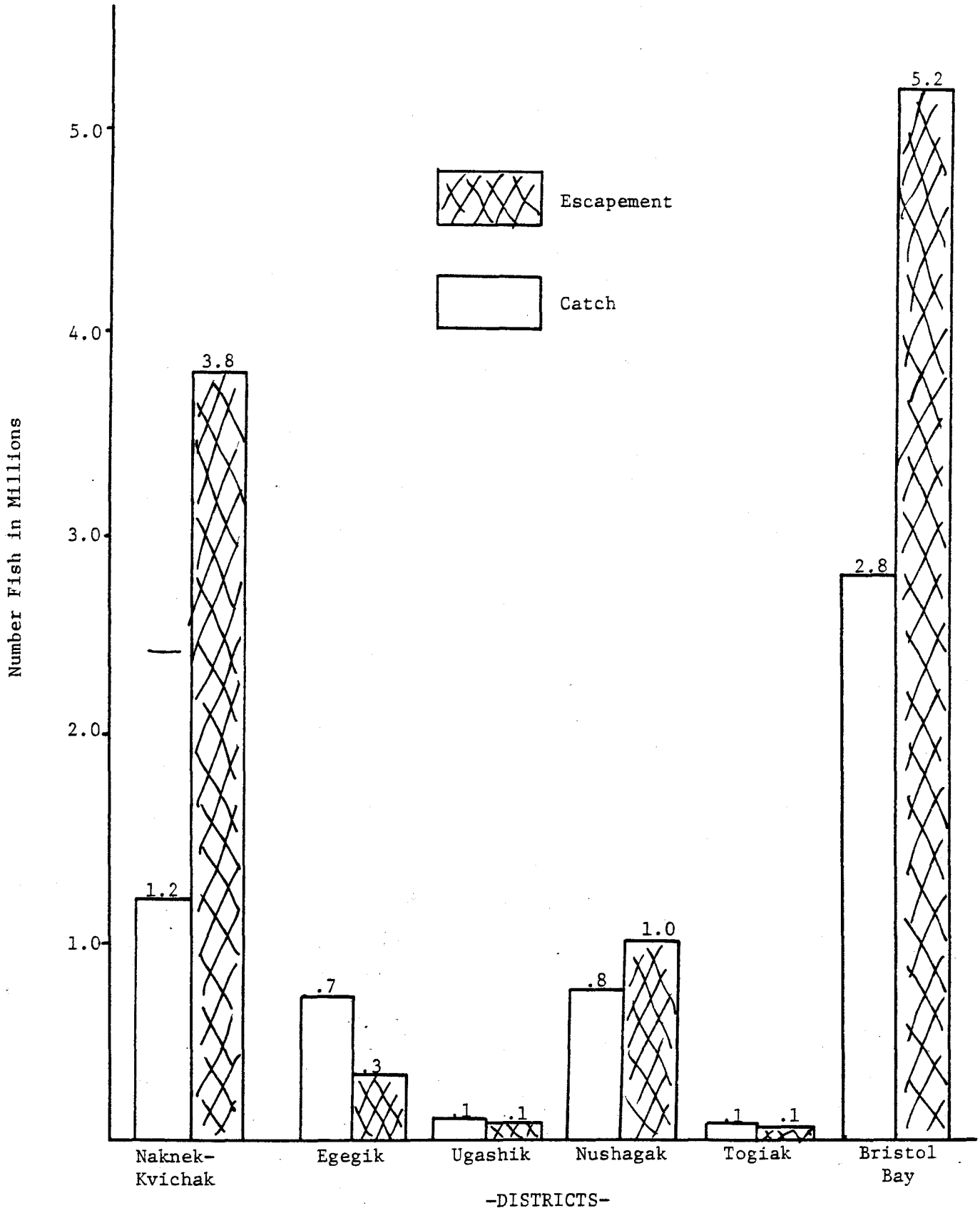


FIGURE 1. Bristol Bay red salmon catch and escapement by district, 1968.

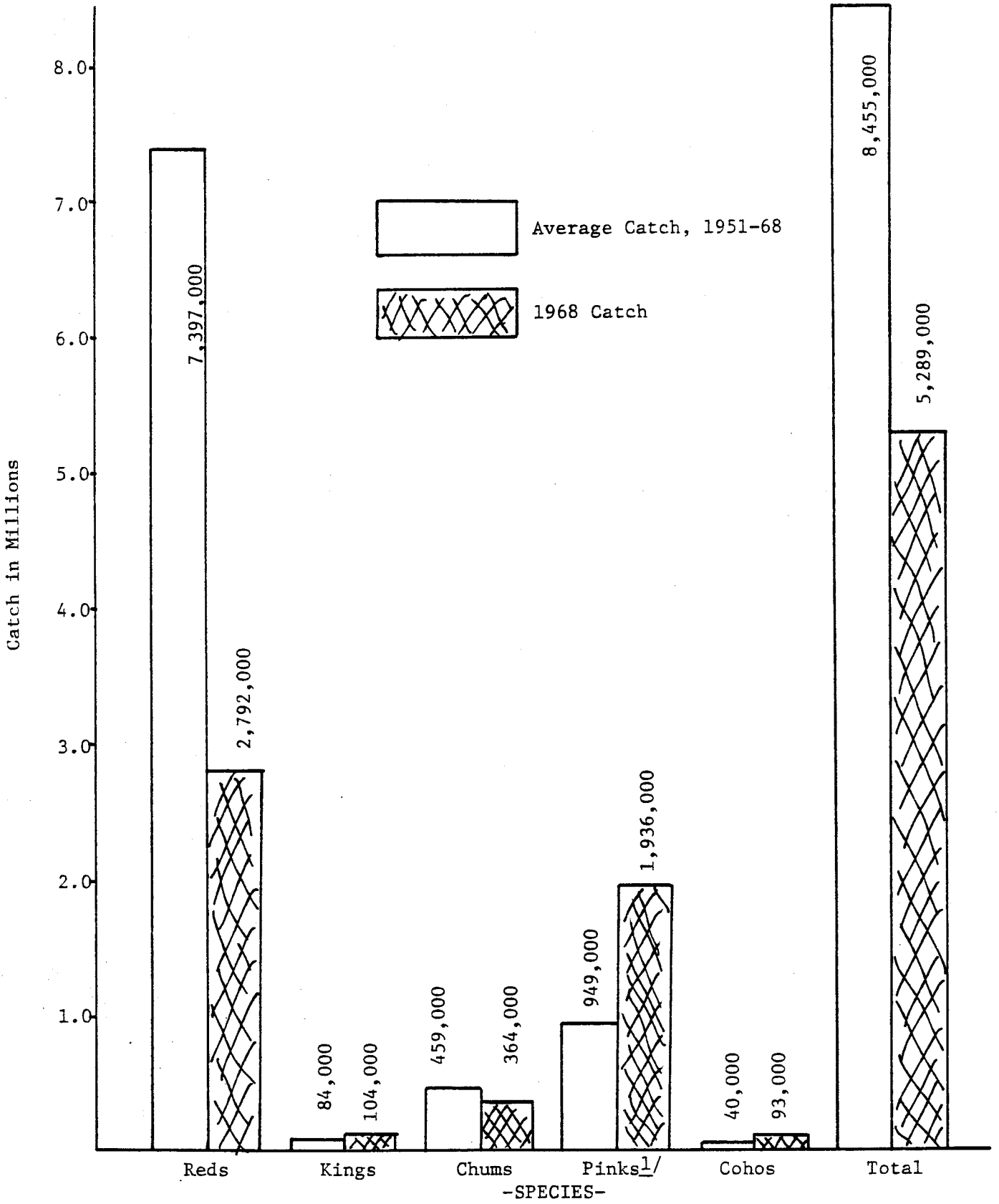


FIGURE 2. Bristol Bay commercial catch by species as compared to average catch, 1951-68.

1/ Even years only.

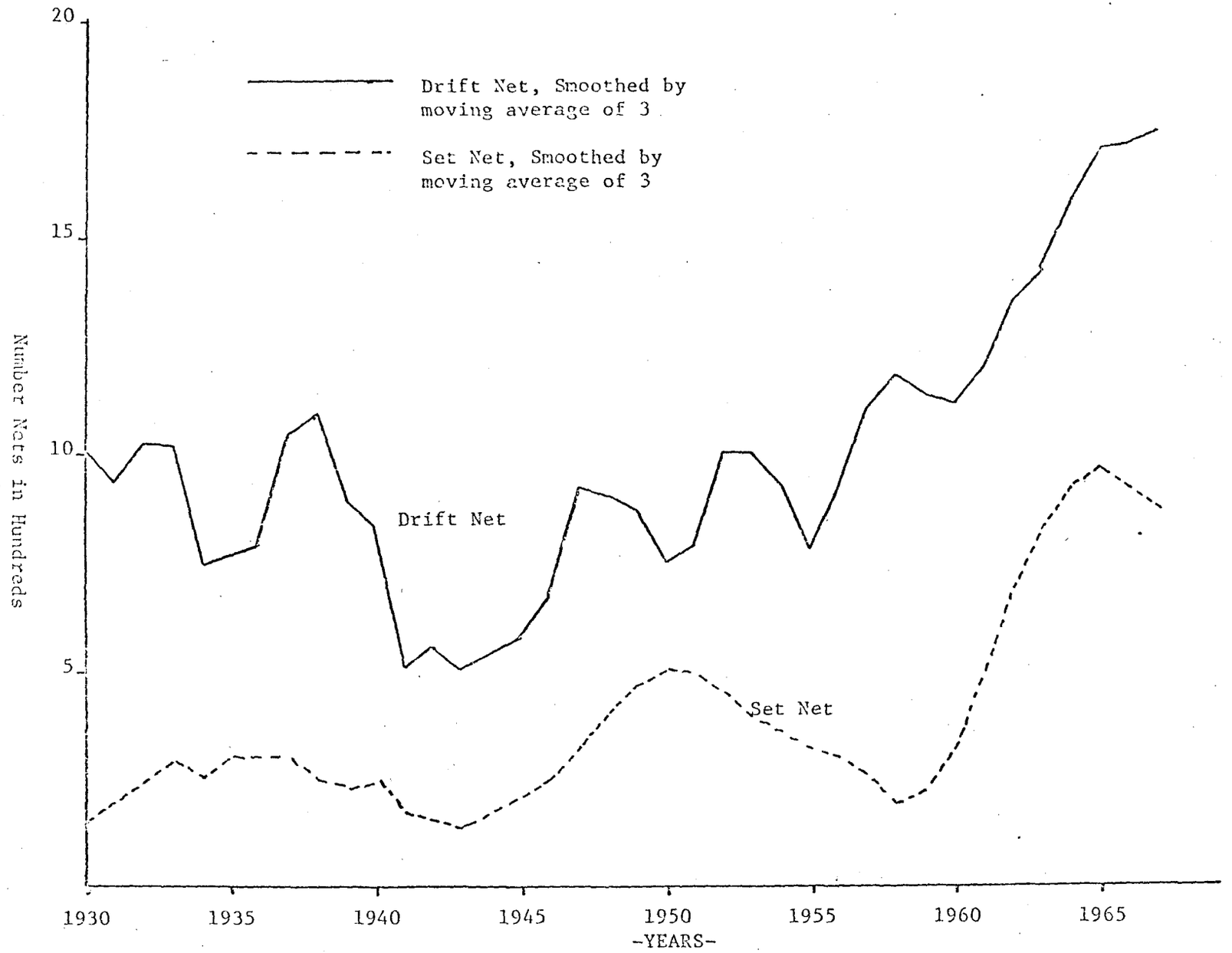


FIGURE 3. Number of commercial drift and set nets registered for Bristol Bay, 1930-68.

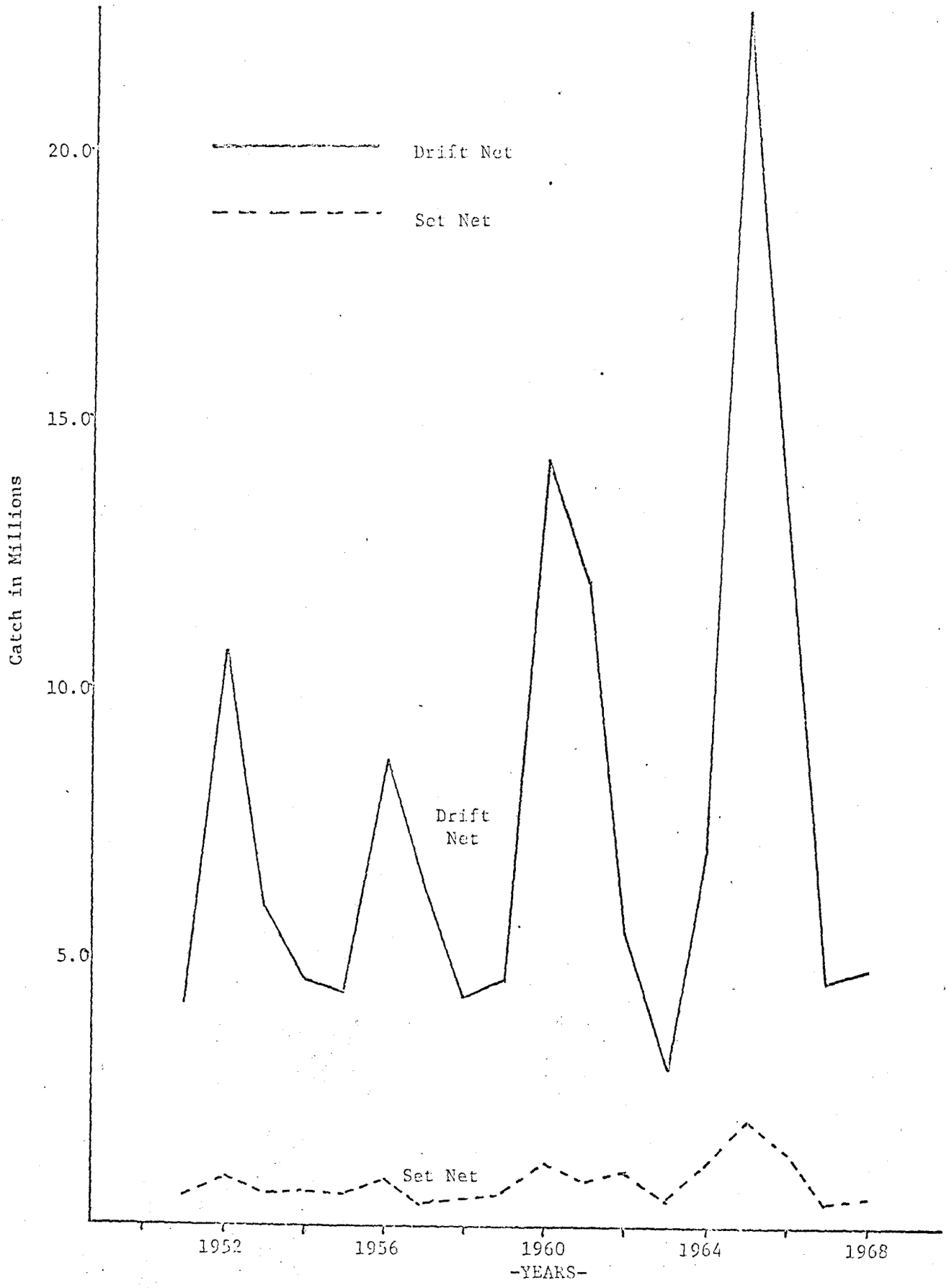


FIGURE 4. Bristol Bay commercial catch by type of gear, all species combined, 1951-68.

Appendix Table 9 summarizes the catch of frozen and cured fish by species and district for the period 1951-68. Prior to 1960 large numbers of red salmon were frozen and transported to Seattle for canning. However, this practice was gradually diminished because of the inferior quality of the pack. Increased utilization of salted red and coho salmon in Japan has revived the cured fish operations in Bristol Bay recently.

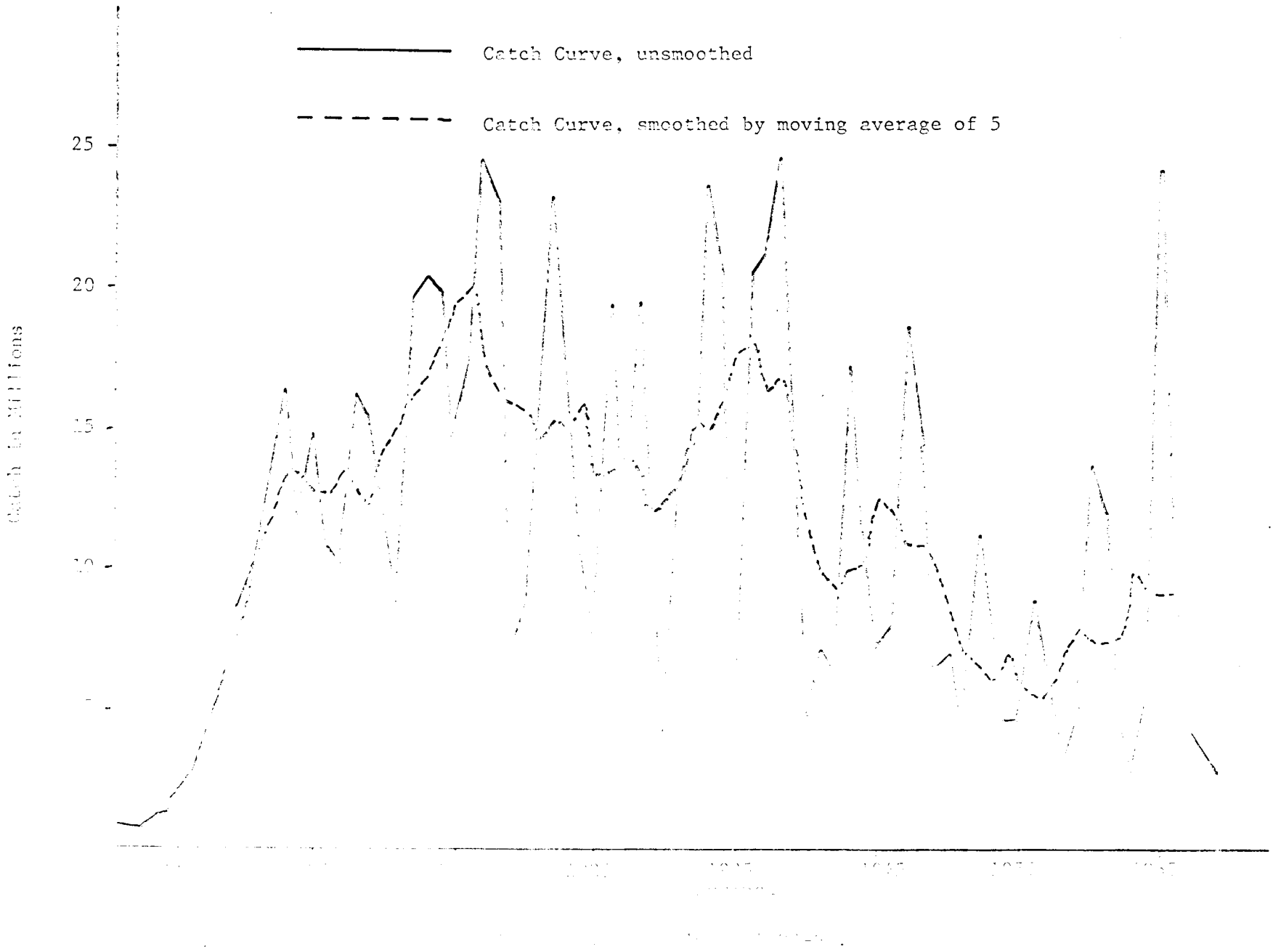
Overall, the 1968 salmon catch for all species ranked eleventh over the past 18 years. The red salmon catch of 2,793,000 was the lowest since 1896, although comparable with other low years in 1958 and 1963 (Figure 5). The king salmon catch of 104,000 was the fifth highest during the same 18-year period, while chum salmon catches amounted to 364,000, and ranked tenth over the last 18 years since 1951 (Figure 6). The pink salmon catch of 1,936,000 was the second largest since 1951, while the late-season coho salmon catch amounted to 93,000, the second highest since 1951 (Figure 6). The total salmon harvest of 5,290,000 was well below the 18-year average of 8,455,000 (Appendix Table 7). By percent, the individual species contributed as follows to the total 1968 catch: 53% reds, 36% pinks, 7% chums and 4% kings and cohos. Table 1 summarizes the 1968 red salmon catch and escapement by district, while Table 14 summarizes the catch by species and district.

The 1968 salmon case pack value totaled approximately $12,500,000 for all species, based on first wholesale value (Appendix Table 12), while the total value of all types of salmon operations (canned, fresh, frozen, salted) plus salmon roe, herring sac-roe and kelp fisheries amounted to an estimated $13,900,000, first wholesale value. Estimated direct income to the State from case pack taxes and fishing licenses was $500,000. The 1968-69 fiscal year operating budget for management of the Bristol Bay fishery resources was $230,000, including management and test fish programs.

Field program activities including escapement enumeration and sampling, catch sampling, smolt enumeration, spawning ground surveys and winter mortality studies were essentially similar to those of 1967. Emphasis was continued on improvement of field camp facilities and program techniques to upgrade quality and accuracy of basic data. The Federal Aid offshore test fishing program near Port Moller was continued as well as the outside and inside test fishing programs, which have proven to be of substantial management value in the regulation of the red salmon fishery.

The present status (1960-68) of the Bristol Bay red salmon stocks when compared with the 9-year period prior to 1960 shows an increasing trend in the inshore catch (8.8 million as compared to 6.0 million), reversing the decline which began in the early 1940's and continued into the mid-1950's (Appendix Table 2).

Several staff changes occurred during 1968. Ken Middleton was appointed to the vacant Central Region Supervisor position, while his Area Management position was filled on an acting basis by Michael Nelson. Linda Lamberson, secretary at Dillingham moved to Nome at the end of the field season and left State employment. Michael Nelson, Acting Area Biologist, transferred to Anchorage in the fall. At the end of the calendar year, recruiting for the Area Biologist position was still in progress.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Catch Curve, smoothed by moving average of 5
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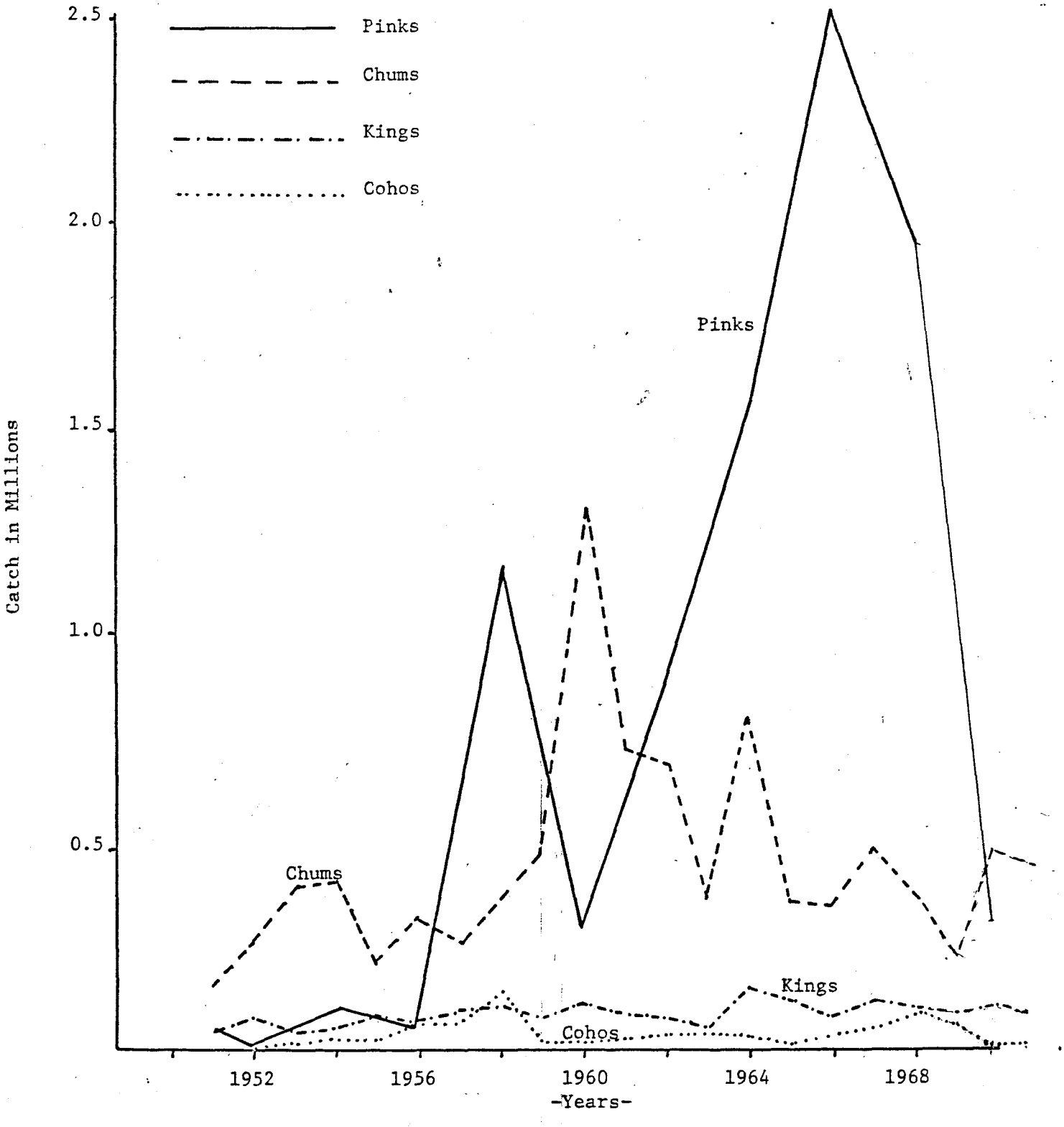

FIGURE 6. Bristol Bay commercial catch by species, excluding red salmon, 1951-68.1/

1/ Even years only for pink salmon.

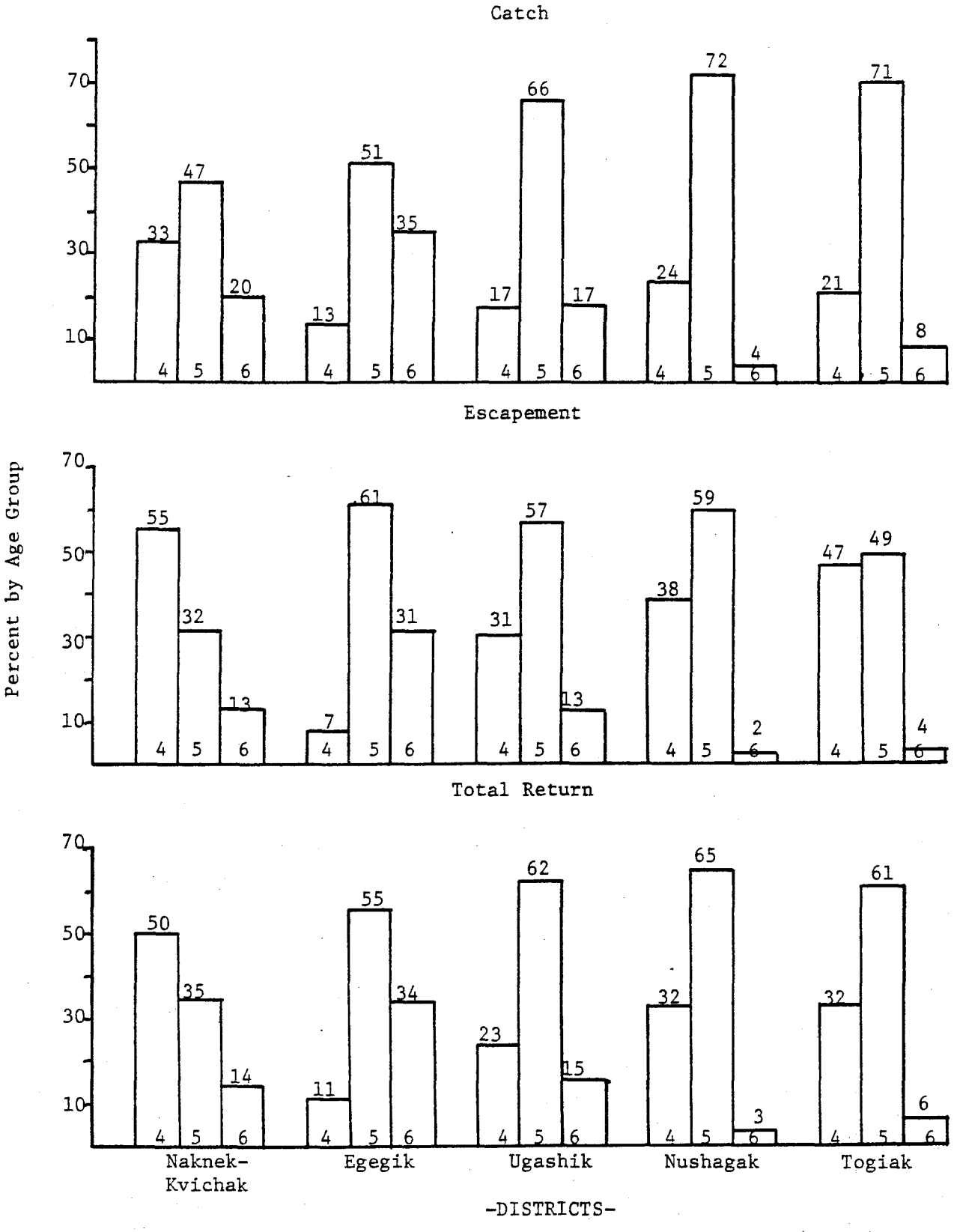

FIGURE 7. Age composition of Bristol Bay red salmon catch and escapement by district and major age groups, 1968.

DISTRICT SUMMARIES

NAKNEK-KVICHAK DISTRICT

A major regulatory change for the 1968 season closed the important Kvichak section of Naknek-Kvichak district. This closure was based on a projected inshore run of only 874,000 red salmon to the Kvichak River (Table 2). When it became apparent that the run had exceeded the forecast, a 24-hour fishing period was allowed on July 11-12. The resultant small catch led to a 23-hour extension, ending at 9:00 a.m. on July 13, the closing time of the emergency order period for 1968. Thus, the Kvichak section was open to commercial fishing for only 47 hours from June 17 to July 13 (Table 4).

The pre-season registered effort for the district was 966 gill nets, 672 drift and 274 set nets, ten units less than the 1967 registration (Table 3). Of this total, 55% were resident registrants and 45% non-residents. The highest number of actual units of gear fishing at any time was 721, or 75% of the registered effort. This agrees closely with a questionnaire survey the staff conducted of all major salmon operators throughout Bristol Bay. This survey revealed that 69% of the registered effort was actually participating in the fishery. Interest was particularly keen on this statistic due to speculation regarding the effect of limitations placed upon new entrants to the fishery in the 1968 regulations.

The total district inshore red salmon forecast was 3,746,000. This was divided to the three contributing river systems as follows: Kvichak - 874,000; Branch - 577,000 and Naknek - 2,295,000 (Table 2). Total actual runs, based on preliminary apportionment were: 2,945,000 to the Kvichak; 255,000 to the Branch and 1,791,000 to the Naknek River. Therefore, the run of red salmon to the district (4,991,000) was 33% higher than the forecast (Tables 1 and 14). By river system the actual runs compared to the forecast were 237% high for the Kvichak, 56% low for the Branch and 22% low for the Naknek.

Management

Allowable fishing time during the June 17 to July 13 emergency order period was 329 hours (Table 4), or over three times that allowed during the 1967 season. As indicated earlier, all but 47 hours of this time was restricted to the Naknek section only.

In 96 hours of fishing time through June 25, only 54,000 red salmon were caught, compared to a 229,000 catch by June 22 in 1967. The first significant catch occurred during a 12-hour period on June 27, resulting in a 185,000 catch to put the cumulative total at 20% of the final catch, twice the average percentage by this date (Table 6). Again, as in 1967, the run was assuming characteristics of being unusually early.

After a 37-hour closure, another 12-hour period was allowed on June 29. The 164,000 red catch put the cumulative catch at 402,000 or 33% of the

season total (Table 6). The preceding day, on June 28, a strong showing of reds began to pass the escapement sampling site, one mile below the Naknek River counting towers, and the daily tower count jumped to 120,000. The daily count on June 27 was only 21,000 fish.

The fishery was kept closed for 51 hours, from June 30 until July 2 to build the escapement on the strength of the strong showing in the Naknek River on June 28. On June 29, the daily escapement dropped to 22,000 again, reflecting the effect of the fishery, but climbed quickly to 83,000 on June 30, and to 136,000 on July 1. The cumulative escapement through July 1 totaled 403,000, or 40% of the 1968 goal (Table 2). This is three times the average percent of the seasonal escapement by this date.

Commencing at 3:00 a.m. on July 2, another 12-hour fishing period was allowed, resulting in a 150,000 fish catch, bringing the total catch to 552,000 (Table 6). The Naknek River towers tallied 106,000 fish, for a total escapement of 509,000 through July 2.

Naknek River daily tower counts for the closed days of July 3 and July 4, were 92,000 and 139,000 respectively, putting the cumulative escapement at 741,000 red salmon with fish still showing strength in the river. Consequently, another 12-hour period was announced for July 5 after a closure of 61 hours. July 5 also marked the highest daily tower count on the Naknek River with 146,000 reds tallied, bringing the escapement up to 887,000.

Activity in the fishery at this point was concentrated heavily in the Pederson Point area with scattered effort along the outer section line. Set net catches along the south beach did not look nearly as good as they did from the mouth of the Naknek River up to the section limit at Pederson Point.

At noon on July 5, the fishing time was extended for another 12 hours, and at 6:00 p.m. the same day, an emergency order was issued extending fishing time in the Naknek section until further notice. The catch for the 68 hours from 4:00 a.m., July 5 through July 7 totaled 342,000, bringing the cumulative catch up to 895,000 reds (Table 6). The escapement through July 7 tallied 936,000 fish.

Fishing continued daily through the next week, and the entire district was opened on July 11 until the close of the emergency order period at 9:00 a.m. on July 13. The total district catch of red salmon was 1,217,000 and the final Naknek River escapement was 1,023,000 (Appendix Table 15).

Age composition of the district runs showed considerable differences between the three river systems. The Kvichak run consisted of 67% 4-year fish from the 1964 parent year escapement, 20% 5-year fish from 1963 and 12% 6-year fish from 1962. The Branch system was composed of 34% 4-year fish from 1964, 57% 5-year fish from 1963 and 6% 6-year fish from 1962. The Naknek River run consisted of 22% 4-year fish from 1964, 58% 5-year fish from 1963 and 19% 6-year fish from 1962.

Thus, the bulk of the 1968 Kvichak run was derived from the 1964 cycle year red salmon escapement of 957,000. The Branch River run was more evenly divided with fish from the 1963 and 1964 escapements of 203,000 and 249,000 respectively. The Naknek River run consisted primarily of fish from the 1963 cycle year escapement of 905,000, with the balance evenly divided from the 1962 and 1964 cycle years. The 1962 cycle year escapement was 723,000 and the 1964 spawning was 1,350,000 (Appendix Table 15).

Overall age composition of the Naknek-Kvichak district red salmon catch and escapement combined was 50% 4-year fish from the 1964 parent year escapement, 35% 5-year fish from 1963 and 14% 6-year fish from 1962 (Figure 7 and Appendix Table 25).

Catch

The Naknek-Kvichak district commercial catch for all species was 1,493,000 fish, 69% below the 18-year average of 4,889,000 (Appendix Table 7). This catch represented 28% of the Bristol Bay total catch for 1968.

Red salmon accounted for 82 percent (1,217,000) of the district catch for all species, and represented 44% of the total red catch for Bristol Bay. The red salmon catch was 74% below the 18-year average of 4,734,000 (Appendix Table 2).

Age composition of the red salmon catch was 33% 4-year fish from the 1964 parent year escapement, 47% 5-year fish from 1963 and 20% 6-year fish from 1962 (Figure 7). The average weight for reds in this district was 5.8 pounds (Appendix Table 22). The sex ratio of the commercial catch was 48% males and 52% females (Appendix Table 23).

The 1968 king salmon catch of 6,000 was higher than the low catch of 4,000 in 1967, but still well below the 18-year average of 9,000 (Appendix Table 3). Increasing interest in fresh and frozen king salmon may see the catch trend rise again to the 10-15,000 level of earlier years.

Chum salmon catches continue to indicate a reduced level of production in this district. The 1968 catch of 43,000 is comparable to the preceding three years, but well below the 18-year average of 116,000 (Appendix Table 4). Although catches of chums were generally down for 1968 throughout the Bay, except for the Togiak district, none of the other districts exhibit the same pattern of low catches as in the Naknek-Kvichak. Differences in computing chum percentages may explain part of this pattern, but other districts should also reflect a trend, if this factor was significant. Unles there is some indication of response in 1969 for these predominantly 4-year old fish, close scrutiny of available data is indicated to explain this pattern of reduced production.

The catch of 219,000 pink salmon in this district marked a new high for recent even-years (Appendix Table 15) and reflected the general high abundance of this species in Bristol Bay in 1968 (Table 14). Pink salmon

are not normally sought in the Naknek-Kvichak district with any appreciable effort. However, in recent even-years, more effort has been directed towards pink salmon, particularly in the low years of the red salmon cycle. It is also apparent that the pink salmon runs have been increasing in size. No explanation is available at this time to explain this phenomena. However, it is apparent that the minimum mesh size of 4-3/4 inches in effect since 1960 is selective to males in the catch. Therefore, in recent years at least, the escapements have been preponderantly in favor of females.

The 1968 coho catch of 7,000 was the highest recorded in the district for the 18 years listed in Appendix Table 6, six and one-half times larger than the 1967 catch and over three times the 18-year average of 2,000. This pattern was exhibited throughout the five districts, and the catch of 93,000 for all of Bristol Bay is 133% above the 18-year average of 40,000 fish (Appendix Table 6).

Escapement

Counting towers were again operated on the three contributing river systems to the Naknek-Kvichak district: Kvichak, Branch and Naknek.

Test fishing at the mouth of the Kvichak River to index daily escapements was also continued in 1968, supplemented by daily aerial counts when weather permitted.

As mentioned earlier, the Kvichak section was closed for the season on the basis of a 874,000 forecast to the system. In line with the management policy to build "off-year" escapements, the staff continued to hold the section closed after it became apparent that the run was exceeding expectations. The final red salmon escapement of 2,557,000 marks a significant increase for this position in the cycle (peak year minus two). This is a 587% increase over the average for the three previous years in the same position of the cycle, 1954, 1958 and 1963 (Appendix Table 15).

While it is not exactly known at this time which "off-year" will prove significant, or at what level the escapement should be to provide the necessary "overlap production" to return to historical levels of production, it is apparent that an off-year buildup will be necessary to alter the one-peak-year dominance characteristic of the present cycle. The lack of any significant numbers of fish in recent off-year runs has been one major problem in securing larger escapements, but severe curtailment of fishing time has been imposed to achieve what gains that have been made. Additionally, it is reasoned that one of the years adjacent to the peak year would probably be the most likely choice, based on the historical pattern of high production for two or three consecutive years.

Since the measurable production for three cycles of the parent year plus one (1953, 1957, 1961) has been poor, and the outlook for the Kvichak in 1969 is good (11.4 million inshore run), emphasis will be upon securing a sizeable escapement from this run toward achieving the objective of higher sustained production.

The 1968 Kvichak River red salmon escapement of 2,557,000 accounted for 68% of the district total escapement of 3,775,000 (Appendix Table 15). The age composition consisted of 68% 4-year fish from the 1964 parent year escapement, 19% 5-year fish from 1963 and 11% 6-year fish from 1962. The sex ratio was 52% males and 48% females, nearly identical to the 1967 escapement (Appendix Table 23).

Test fishing indices for the Kvichak River yielded the poorest correlations to actual escapement to date, under-estimating by over 100%. Channel changes were indicated, and a second site was selected for test drifts. This site produced higher index catches.

Branch River, tributary to the Kvichak, received an escapement of 194,000 out of a run of 255,000 reds. This is an above average escapement for recent years, when compared with the 147,000 average escapement since 1961 (Appendix Table 15).

The Naknek River escapement was 57% of the system run, leaving a 43% harvest. The 1,023,000 escapement was 11% above the average of 919,000 (Appendix Table 15), and is the seventh consecutive year that the level has been 700,000 or larger. The escapement sex ratio was 55% males and 45% females (Appendix Table 23).

The overall age composition of the Naknek-Kvichak district red salmon escapement was 55% 4-year fish from the 1964 parent year escapement, 32% 5-year fish from 1963 and 13% 6-year fish from 1962 (Figure 7).

EGEGIK DISTRICT

Egegik district fishing boundaries remained unchanged from 1967, and no changes were made during the season.

The registered drift and set gill net gear totaled 484 units, 28 units lower than in 1967 (Table 3). Drift gill net registrants increased by two units to 285 from 1967, and set gill net registrants decreased by 30 units to 199 (Table 3). Fifty-four percent of the registrants were residents and 46 percent non-residents. The highest number of actual units fishing occurred on June 30 when 394 individual deliveries were made, coinciding with the peak catch period (Table 5).

The inshore forecast to the Egegik district was for 2,093,000 red salmon. The actual run was 1,010,000 or only 48% of the forecast, and 50% below the 18-year average run of 2,000,000 (Appendix Table 16). This was the second consecutive year that the Egegik run was substantially below the forecast.

Management

No appreciable catches were made until June 24-25 during a 24-hour period when 83,000 reds were taken which brought the cumulative catch to 120,000 through June 25 (Table 7). In 1967, a catch of 397,000 had been realized by this same date. However, this catch still represented 18% of the final catch which is twice as high as the average by this date.

A 50-hour closure was maintained after the 24-hour open period ending on June 25. A 12-hour opening commenced on June 27, which is unusually early to drop down to the now almost standard 12-hour periods of recent years, but last year's experience of a 506,000 catch on June 28 in this district which marked the peak of the run, was still fresh in our minds and dictated a cautious approach to openings.

The June 27 catch of 151,000 reds was not large, especially compared to 1967, but the cumulative catch of 270,000 by this date was still 26% above average, indicating an earlier than normal run (Table 7).

The fishery was kept closed for 62 hours before another opening on June 30. Up to this time the index from test fishing inside the Egegik River indicated approximately 300,000 fish in the escapement. However, continuous aerial observations of the large lagoon area below the counting towers did not bear this out. Consequently, a revised equation for estimating daily escapements was formulated, and the total estimated escapement to date was re-computed at 90,000 fish. This was cause for concern, but test fishing throughout June 28 and 29 along the coastline from Red Bluff to Middle Bluff indicated good numbers of fish along the entire area with movement toward the Egegik River. The highest single catch to date for the inside test boat was made on June 29.

All indications were that the run was not yet peaking, but that a good buildup of fish was occurring along the entire outer beach to Middle Bluff. Also, at this point we could only account for about 18% of the expected run, including the catch and revised escapement estimate. Consequently, another 12-hour period was allowed on June 30, and the catch totaled 215,000 reds, which brought the accumulative red salmon catch to 486,000 (Table 7).

The fishery remained closed for 76 hours after the June 30 opening. During this period test net catches were carefully watched and evaluated. Outside test fishing beginning on July 1 continued to make excellent catches in the areas of Middle Bluff, Cape Chichagof and as far down as Red Bluff. On July 2 one of the highest catches of the season was made at Middle Bluff (771 fish in 25 minutes). All fish were moving towards Egegik.

On July 3, excellent catches were made by the outside test boat throughout the district and it appeared that fish were moving steadily and heavily into the Egegik River. During this same period the inside test boat catches picked up sharply on July 2 and rose to the highest point of the season on July 3.

Therefore, by all reasonable measures, the peak of the run appeared to have occurred and was well into the district and river system. Still expecting some 1,500,000 fish and knowing how rapidly fish move through this district, the staff announced another 12-hour period for July 4. The resultant catch of 181,000 reds was surprisingly low in view of the indications (Table 7). Either the bulk of the fish had already entered the river, or else they moved northward out of the district, or possibly the test catches were not indicative of actual abundance.

Subsequent to the 12-hour opening on July 4, the inside test catches dropped off sharply and never rose to a significant level again. Aerial surveys of the Egegik lagoon were disappointing in view of the encouraging indications from outside and inside test catches on July 2 and 3. At 9:00 p.m. on July 7 the staff announced that the Egegik district would remain closed until further notice. The fishery was not opened again until after the emergency order period at 9:00 a.m. on July 15, a closure of 257 hours during the normal peak period of the season. The district was open for only 36 hours between June 25 and July 15.

The inshore run was only one-half of the forecast, and the smallest total run in 11 years (Appendix Table 16). The catch was the lowest in seven years and the escapement the lowest in 11 years. As in 1967, this again points out the dangers in managing these short duration runs in small districts with high levels of gear. Apparently, the fish were earlier than normal, as last year, but remained offshore and in outer areas of the district much longer than normal, and rather than moving into the district and river proper, tended to mill back and forth in the Cape Chickagof-Middle Bluff areas. Another possibility, of course, is that the outside test boat was in fact catching fish bound for the Naknek-Kvichak systems.

The overall age composition of the 1968 Egegik run consisted of 11% 4-year fish from the 1964 parent year escapement, 55% 5-year fish from 1963 and 34% 6-year fish from 1962 (Figure 7 and Appendix Table 26). The parent year escapements were 850,000, 998,000 and 1,027,000 respectively (Appendix Table 16).

Catch

The Egegik district commercial catch for all species was 698,000 fish, 13% of the total Bristol Bay catch in 1968, and 43% below the 18-year average of 1,231,000 (Appendix Table 7).

As usual, red salmon dominated the district catch and accounted for 96 percent of the total (Table 7). The red salmon catch of 672,000 was 24% of the total Bay catch and 44% below the 18-year district average of 1,199,000 (Appendix Table 2).

Age composition of the district red salmon catch was 13% 4-year fish from the 1964 parent year escapement, 51% 5-year fish from 1963 and 35% 6-year fish from 1962 (Figure 7). Average weight for red salmon was 6.1 pounds (Appendix Table 22). The sex ratio was 45% males and 55% females in the catch (Appendix Table 23).

The king salmon catch of 3,000 was above average, but only 3% of the total for Bristol Bay (Appendix Table 3).

The chum salmon catch of 16,000 is below average (26,000), but higher than 1967, and does not reflect any discernible pattern (Appendix Table 4).

The 1968 coho catch of 7,000 is small by other standards, but well above average for this district and the highest catch since 1956 (Appendix Table 6).

Escapement

The 1968 escapement of 339,000 was the lowest attained in this system since 1958 and is the first significant drop in escapement in 10 years (Appendix Table 16). From 1960 through 1967 the average escapement has been 1,033,000 fish, up 425,000 over the previous eight year average of 608,000. The 1968 total district escapement was 58 percent lower than the 18-year average of 801,000 (Appendix Table 14).

It would appear, based upon the poor runs of 1967 and 1968, both composed of 5-year and 6-year fish primarily, that the 1962 and 1963 parent years in this system were poor producers. A similar and more drastic drop in production for these same two parent years is noted in the Ugashik system.

The age composition of the Egegik district red salmon escapement was 7% 4-year fish from the 1964 parent year escapement, 61% 5-year fish from 1963, and 31% 6-year fish from 1962 (Figure 7). Sex ratio of the escapement was 46% males and 54% females (Appendix Table 23).

UGASHIK DISTRICT

The Ugashik district fishing boundaries were not altered from the 1967 limits, when the area was enlarged slightly.

Gill net registration in 1968 totaled 151 units, 73 drift and 78 set net units (Table 3). Of the total, 74% registrants were residents and 26% non-residents. Overall, the 1968 registration was 18 units lower than 1967, with 25 less drift gill nets and 7 more set gill nets. However, the highest level of gear actually participating in the fishery was 89 units recorded on July 7-8 (Table 5).

The forecast indicated an inshore run of 1,050,000 red salmon (Table 2). The actual run of 153,000 was the lowest on record, and only 15% of the forecast (Table 1).

Management

The commercial catch through June 25 was only 5,000 red salmon although 96 hours of fishing had already been allowed by emergency order (Table 8). This pattern of liberal fishing time and small catches continued through the season, with 24-hour openings spaced by 50-hour closures. This was possible because of the small, steady run of fish plus the limited fishing effort present. The highest catch occurred during a 24-hour period on July 7-8, when 22,000 fish were caught (Table 8).

From June 17 through July 8 and 192 hours of fishing time, the catch totaled only 67,000. The fishery was kept closed for seven days to secure as much escapement as possible out of the obviously poor run. Additionally, an extra closure of 48 hours was imposed during the week of July 15-20 when the fishery would normally revert to five days-per-week.

The 1968 overall Ugashik district red salmon run consisted of 23% 4-year fish from the 1964 parent year escapement, 62% 5-year fish from 1963 and 15% 6-year fish from 1962 (Figure 7).

Catch

The 108,000 commercial catch for all species for the Ugashik district is the lowest recorded during the past 18-years, representing only 2% of the total Bristol Bay catch, and 77% below the average catch of 467,000 (Appendix Table 7).

Red salmon made up 76% of the district catch. The catch of only 82,000 reds set a record low, 81% below the 18-year average of 438,000 (Appendix Table 2).

The age composition of the catch varied only slightly from that of the total run. The 1963 parent year contributed 71% 5-year fish, and the 4-year and 6-year fish contributed 21 and 8% respectively (Figure 7). The sex ratio of the commercial red catch was 51% males and 49% females, while the average weight was 5.9 pounds (Appendix Tables 22 and 23).

The king salmon catch of 2,000 was just about average and up over the previous two years (Appendix Table 3).

Chum salmon were slightly below average with a catch of 18,000 (Appendix Table 4).

Pink salmon do not occur in this or the Egegik district in any appreciable numbers. None were reported for Ugashik in 1968.

The coho catch of 6,000 is the largest recorded since 1951. Coho catches, as in the other districts, generally reflect effort more than actual abundance. Most major operators are closed by the coho season, and only an occasional small canner or scattered fresh and salted operators handle cohos. There

seems to be more effort directed to this species during the poorer red seasons, reflecting efforts of small operators trying to "stretch" the short red season.

Escapement

Evaluating escapement into the Ugashik River during the season is more difficult than in many of the other river systems in Bristol Bay. Not only is the river muddy up to the clear water lagoon just below the lake outlet, but the migration rate of red salmon in this river is much slower than in other systems of comparable length in Bristol Bay.

The inside test fishing program can be a considerable help in evaluating the relative magnitude of the escapement at a given time. Like most sampling programs, considerable error can occur, particularly if the unit being measured varies drastically from previously measured units. This was the case in Ugashik in 1968. The test fishing indices over-estimated the small numbers of fish by 300%. However, the fishery itself gave a good indication of the small numbers of fish actually present, and the run could be measured consistently through the season because of the limited fishing effort.

The 1968 final Ugashik district escapement of 71,000 red salmon is the smallest on record, and is 86% below the 18-year average of 520,000 (Appendix Table 16).

The age composition of the district escapement was 47% 4-year fish from the 1964 parent year escapement, 49% 5-year fish from 1963, and 4% 6-year fish from 1962 (Figure 7). The sex ratio of the escapement was 47% males and 53% females (Appendix Table 23).

NUSHAGAK DISTRICT

The Nushagak district fishing boundaries remained unchanged from 1967, and no boundary relocations were implemented during the season. The Igushik section was re-opened to fishing in 1968 after a regulatory closure in 1967 to protect the small expected run. Separate openings were employed for the third consecutive year between the Nushagak and Igushik sections, which resulted in near optimum red salmon escapements in both systems. The Snake River section remained closed to fishing from June 17 until the end of the season in an effort to protect the small forecasted red salmon run.

The emergency order period, which began on June 17 and continued through July 13, was preceded by a 5 day-per-week fishery on Nushagak king salmon stocks. Effective this year was a minimum mesh size restriction of 7 inches stretch measure, reduced from the 7-1/2 inch minimum mesh effective in 1967. This mesh size was in effect prior to June 21, after which time the smaller "red salmon" gear of 5-3/8 inch stretch measure was allowed. Most fishermen use 8 inch stretch measure nets in the Nushagak king fishery.

Pre-season fishing gear registration for the district was 811 gill nets, including both drift and set net gear, 39 more than in 1967 (Table 3). Of this total, 84% were resident registrants and 16% non-residents. Of the 257 set nets registered for fishing in 1968, only about 190 actually participated in the fishery. Many resident fishermen license both drift and set net gear, but do not actually use their set net gear. The highest effort recorded for both types of gear, based on fish ticket deliveries, indicated that 566 units of gear participated in the fishery at the peak of the red salmon run and 715 units at the peak of the pink run (Table 5). In 1967 the highest recorded effort at the peak of the red salmon season was 569 units, including both set and drift gear.

The total district inshore red salmon forecast of 3,298,000 had 2,536,000 assigned to Wood River; 272,000 to Igushik River; 400,000 to Nuyakuk River; and 90,000 to Snake River and the Nushagak-Mulchatna system combined (Table 2). Total return runs based on preliminary apportionment by river system were: Wood - 858,000; Igushik - 384,000; Nuyakuk - 368,000; and Snake-Nushagak-Mulchatna - 116,000; for a total run of 1,726,000 or 52% of the forecasted run to the district (Tables 1 and 14). The failure of the Wood River run resulted in the majority of the error between the forecast and actual return. The total run of king salmon was estimated to be from 138,000 to 158,000, while the chum salmon run approximated 269,000 to 289,000 fish. The poor Wood River red salmon run and resultant economic consequences were somewhat alleviated by the record run of pink salmon, which totaled 3,866,000, catch and escapement combined.

Management

During the first week of emergency field regulation (June 17-23), two 24-hour fishing periods were allowed with king salmon catches totaling 25,000 (Table 9). The total king catch through June 22 was 62,000, compared with the previous 10-year average catch of 55,000 for this period of time. When the above average king catch was compared with low escapement trends and upriver subsistence catches, and extremely poor inside test fishing results (i.e., 26 standard one-half hour drifts with a catch of 31 kings), there was considerable concern that the rate of harvest was excessive. Consequently, the district was kept closed for 74 hours in an effort to build up the escapement. Twenty-four hours after the open fishing period on June 21-22 a N.E. storm drove large numbers of kings into the fishing area and past the fishery (i.e., test boat caught 283 kings on 10 standard one-half hour drifts just inside the commercial fishing area). The fishery was kept closed for an additional 50 hours to insure an adequate king escapement.

The next fishing period on June 25-26 produced a red salmon catch of 153,000, most of which were taken in the outer portions of Middle and West Channels (Table 9). After examining length frequencies and scales it was theorized that most of these fish were of Igushik River origin. Timing of the Igushik River escapement counts which began to climb on June 26-27, gave added emphasis that many of the 162,000 reds caught through June 26 were of Igushik origin.

The Igushik River red salmon escapement reached 23,000 (15% of the escapement goal) by June 27 with good numbers of fish in the river as indicated by aerial surveys. Due to the good early season escapement and a good showing of fish in the Igushik River, a 12-hour fishing period, beginning at 2:00 a.m. June 28, was announced for the Igushik section. The low accumulative red salmon escapement of 26,000 through June 27, past the Wood River tower did not warrant a Nushagak section opening.

The 12-hour Igushik section fishing period produced a red catch of 60,000 (Table 9). The Igushik and Wood River accumulative red salmon escapement counts climbed to 46,000 and 68,000 respectively, through June 28, with good indications of fish in the rivers below the towers. Test fishing efforts on June 28 in the Nushagak section indicated a large build-up of fish both in and outside the district.

With an adequate escapement in Wood and Igushik Rivers and indications of a build-up of fish in the Nushagak section, a 12-hour period for the entire district was announced for June 30. The catch for June 30 was good as expected, amounting to 267,000 red salmon, however, all fish were caught in Middle Channel near Ekuk cannery, with no indications of more fish moving into the district (Table 9). Subsequent test fishing efforts could locate no concentrations either in or outside the fishery, and since the Wood River tower count had fallen off, with 98,000 reds counted past the tower through June 30, and a total catch to date of 489,000 red salmon, it was decided to keep the Nushagak section closed until a good show of fish entered Wood River. Concern was also felt over the large proportion of .3 ocean fish (as high as 80%) in the early season catches, when in fact, the pre-season inshore forecast called for over 71% of the total district run to be composed of .2 ocean fish.

The Igushik River red escapement continued to climb and when aerial surveys again indicated considerable numbers of fish in the river with no apparent decline due to the fishery, another 12-hour fishing period was announced for the Igushik section for July 2-3. Subsequent catches of 42,000 red salmon and a good accumulative escapement of 137,000 through July 3, prompted a 24-hour fishing period in the Igushik section beginning on July 4 which was later extended through July 7 due to the achievement of the Igushik River escapement goal (Table 9).

The Igushik section was closed for 24 hours on July 7-8 when it became apparent that a S.E. wind was pushing Wood River bound fish into the open Igushik section.

The Nushagak section was re-opened on July 10, after a 10-day closure, when adequate red salmon escapement (563,000 through July 9) was assured at Wood River. Late season fishing from July 10-13 resulted in a good catch of 48,000 chum salmon (Table 9).

Pink salmon began to enter the catch in considerable numbers on July 15, when 4-3/4 inch pink salmon mesh nets were allowed into the fishery. Although a formal pink salmon forecast is not made, escapement-return relationships indicated a run magnitude of 3.5 to 4.5 million. As in 1966, fishing effort continued to build with transfers from other

districts and by July 20, 571 boats and skiffs and 144 set nets were participating in the fishery (Table 5). Even with the large effort and continuous fishing time from July 15 through August 10, when only one 24-hour closed period was announced, the fishery still could not adequately harvest the small-sized pinks. It eventually became necessary to lift the fishing gear restriction on the length of net fished and allow the full 150 fathoms for drifters and 50 fathoms for set netters in an attempt to adequately harvest the returning pink run.

Late season effort in the Nushagak district on coho salmon stocks was expanded over previous years with the development of cured fish markets in Japan.

The weather in 1968 was very mild and warm, with very few major storms occurring during the course of the season. The extremely mild weather resulted in poor catches by local set net fishermen, since they are dependent on winds to drive fish onto the beach (Table 15).

Overall age composition of the Nushagak district red salmon catch and escapement combined was 32% 4-year fish from the 1964 parent year escapement, 65% 5-year fish from 1963, and 3% 6-year fish from 1962 (Figure 7 and Appendix Table 28).

Catch

The Nushagak district commercial catch for all species of salmon was 2,760,000, representing 52% of the total Bristol Bay catch for 1968 (Table 9). This catch was 64% higher than the 18-year average of 1,681,000 for the district (Appendix Table 7).

The red salmon catch of 749,000 represented 27% of the Bristol Bay total red catch, which was 19% below the average catch of 925,000 since 1951 (Appendix Table 2). Red salmon also contributed 27% of the total district harvest in 1968. Age composition of the district catch was 24% 4-year fish from the 1964 parent year escapement, 72% 5-year fish from 1963 and 4% 6-year fish from 1962 (Figure 7). The sex ratio was 49% males and 51% females (Appendix Table 23). Average weight for reds based on random sampling was 6.5 pounds (Appendix Table 22).

The Nushagak district king salmon catch of 78,000 was the seventh largest catch in the last 18 years, and was 22% higher than the average catch of 64,000 for this period (Appendix Table 3). As usual, the Nushagak king catch accounted for over 75% of the total Bristol Bay catch (Table 14). There has been a definite shift in processing of kings from canned to fresh and frozen in the Nushagak over the past two years (Appendix Table 9). This trend will probably continue in future years as market demand for fresh-frozen and salted fish increases. Age composition of the major age classes of the king salmon catch was 7% 4-year fish from the 1964 parent year escapement, 33% 5-year fish from 1963, 50% 6-year fish from 1962 and 9 percent 7-year fish from 1961. Average weight of kings sampled randomly throughout the season was 22.2 pounds (Appendix Table 22). The sex ratio was 57% males and 43% females.

Chum salmon are taken concurrently with red salmon in the Nushagak district (Table 9). The total catch of 179,000 was 18% lower than the average catch of 219,000 for the past 18 years (Appendix Table 4). Scale analysis showed that 66% of the chums were 4-year fish from the 1964 parent year escapement and 27% were 5-year fish from 1963, while the average weight was 6.9 pounds. The sex ratio of the commercial catch was 31% males and 69% females.

The even-year pink salmon run to the Nushagak district produced a catch of 1,705,000, the second largest and 91% higher than the average even-year catch of 891,000 for the past 18 years (Appendix Table 5). The fish per case was over 26 and random sampling of the catch showed that the pinks averaged 3.2 pounds (Appendix Table 22). The small size of the 1968 pink run was evidenced by the inability of the fish to gill in the 4-3/4 inch mesh nets employed in the fishery. The selective gill net fishery produced a catch that was composed of 83% male fish and 17% females (Appendix Table 24).

The catch of 49,000 coho salmon was the largest since 1958 and represents a 75% increase over the past 18-year average of 28,000 (Appendix Table 6). Sampling of the commercial catch showed that the cohos averaged 7.6 pounds and 96% were 4-year fish from the 1964 parent year escapement (Appendix Table 22).

Escapement

Counting towers were maintained on Wood, Igushik, Nuyakuk and Nushagak Rivers for the purpose of enumerating red salmon escapement into these systems. Aerial surveys were employed to determine red salmon escapement into the Snake River system, where a tower station is not maintained.

One of the major problems involved in managing the Nushagak district is the difficulty of achieving differential harvest rates on red salmon stocks bound for the different rivers in the district. In 1968, escapement goals were achieved only in the Igushik River and Nushagak-Mulchatna systems (Table 2). However, the Wood and Nuyakuk River escapements fell into the lower range of the desired escapement when viewed in terms of the total system return (Table 2). Total escapement to the district was 977,000 or 57% of the total red salmon run. The escapements and percent of the district total by system were: Wood - 649,000 (66%); Igushik - 195,000 (20%); Nuyakuk - 97,000 (10%); Nushagak-Mulchatna - 32,000 (3%); and Snake - 4,000 (+%). The 1968 total district escapement was 16% lower than the 18-year average of 1,162,000 (Appendix Table 17). Analysis of scales showed that the major age classes of the red salmon escapement to the major rivers were: Wood - 40% 4-year fish from 1964, 57% 5-year fish from 1963, and 3% 6-year fish from 1962; Igushik - 48% 4-year fish, 50% 5-year fish and 2% 6-year fish; and Nuyakuk - 10% 4-year fish and 89% 5-year fish. Overall age composition of the Nushagak district red salmon escapement was 38% 4-year fish from the 1964 parent year escapement, 59% 5-year fish from 1963 and 2% 6-year fish from 1962 (Figure 7). Sex ratios of the major river system red salmon escapements were: Wood - 47% males and 53% females; Igushik - 49% males and 51% females; and Nuyakuk - 46% males and 54% females (Appendix Table 23).

King salmon counted past the Nushagak River tower totaled 15,000. This was considered a minimal count because of the mid-stream migratory habits of king salmon and the lateness of the counting tower operation. Peak tower counts were made shortly after counting began on June 27. Further, upriver area residents report that normally kings began to appear in personal use catches in late May. The earliest reported upriver king salmon personal use catch was on May 20 in 1966. Upriver refers to the three major villages above the counting tower site (Ekwok, New Stuyahok and Koliganek). All these factors indicate that a significant portion of the kings had already passed the tower site before it was operational. Experience and aerial survey observations at the tower have shown that even when counting is possible, the majority of kings migrate in the middle section of the river and cannot be seen from the counting tower. To derive an estimate of the total escapement to the district, it becomes necessary to evaluate various data including: spawning ground surveys, tower counts and commercial and subsistence catches. The estimated total district king escapement of 60-80,000 was made after analysis of these data.

A weir was operated on the Stuyahok River in 1968 and over 5,000 king salmon were counted through the gate. Subsequent aerial surveys of the Stuyahok River system provided an aerial estimate which was 48% of the known total king population. Care must be used in applying this ratio to other streams because of differing physical and climatic conditions. However, the Stuyahok project does indicate in general terms what a comprehensive aerial survey under ideal conditions can account for in terms of total spawning populations.

Escapement of chum salmon enumerated at the Nushagak River counting tower in 1968, was the highest in the three years of operation (i.e., 1966 - 40,000; 1967 - 28,000; 1968 - 72,000). Because of the unusually low, clear water, good counting conditions throughout most of the season and the inshore migratory habits of chum salmon, the tower estimate of 72,000 was considered to more closely approximate the total chum spawning population than in the previous two years. The most probable total escapement to the district after analysis of tower and weir counts, aerial surveys and commercial and subsistence catches, was estimated to be in the range of 90-110,000. Over 10,000 chums were enumerated through the Stuyahok River weir, where in addition to a total stream spawning count, random sampling of the escapement showed an age composition breakdown of 3% 3-year fish from the 1965 parent year escapement, 58% 4-year fish from 1964 and 39% 5-year fish from 1963. The imbalance in the sex ratio of the Stuyahok River chum salmon escapement (i.e., 71% males and 29% females), is probably due to the effects of the selective gill net fishery toward the female portion of the run.

Pink salmon were enumerated and sampled at the Nuyakuk River counting station where the majority of the district escapement passes on their way to the spawning grounds in the upper protion of the Nuyakuk and Tikchik Rivers. The total observed escapement of 2,161,000 was the highest recorded escapement since the establishment of the Nuyakuk River counting station in 1960 (Appendix Table 24). Sex ratio of the spawning escapement was 71% females and 29% males, or almost a direct reversal of the sex ratio obtained in the commercial catch (Appendix Table 24).

TOGIAK DISTRICT

The Togiak district is comprised of five sections: Cape Peirce, Osviak Matogak, Togiak and Kulukak, with the Togiak River section accounting for the majority of the district's commercial catch. Several boundary relocations and section closures were in effect in 1968. The Kulukak section outer fishing boundary was relocated farther inshore to reduce the interception of early season red salmon bound for the Togiak River system. The Ungalikthluk and Nunavarchak sections were eliminated as fishing areas in 1968, after analysis of data from these headland fisheries indicated that most of the fish caught were destined for the Togiak River. The commercial fishery in the above three areas (Kulukak, Nunavarchak and Ungalikthluk) were primarily headland fisheries, with the majority of the fish bound for rivers other than the area in which they were caught.

Licensed fishing gear for the district was 111 gill nets, including both drift and set net gear, which was 11 units more than in 1967. The majority of the drift fleet of double-end sailboat conversions and skiffs fished the Togiak River section, while 33 units of gear fished the Osviak-Matogak area, an increase of 79% over 1967. The Kulukak section effort (11 units) was much reduced over previous years due to the boundary relocation. The Togiak district salmon fishery is almost entirely a resident fishery, with only one non-resident fisherman registered for fishing in 1968.

The district inshore red salmon forecast was for 257,000 red salmon (Table 2). Total runs for the various river systems in the district totaled 129,000 red salmon, or 50% of the forecasted run (Table 1).

The total run of king salmon was estimated to be from 25,000 to 28,000, while the chum and coho salmon runs were estimated at 456,000 and 38,000 respectively. The chum salmon run was the largest on record.

The poor red salmon run plus heavy fishing effort, which has increased 35% since 1960, resulted in reduced fishing time in the Togiak section in 1968, the primary red salmon fishery in the district. The Togiak and Kulukak sections were open 4 days-per-week in 1968, while Cape Peirce, Osviak and Matogak sections were open 5 days-per-week. The poor red salmon run to the Togiak River system resulted in 4 days of additional closure in that section to obtain an adequate escapement.

Management

The fishing season progressed as expected, although concern was felt over the low weekly red salmon catches in the Togiak section. The red salmon accumulative catch of 38,000 by July 5 was considerably below the average of 77,000 for 1960-67, and resulted in additional closures on July 10-12 and July 15-17, to assure a balanced catch and escapement (Table 1).

The large chum salmon run and late season coho salmon fishery helped to alleviate the severe economic condition resulting from the poor red

salmon run. The chum salmon run is concurrent with red salmon in the Togiak district, thus when the red run is poor as in 1968, and the chum run is good, the desired harvest rate on chums is not obtained. This problem was especially acute this season, as the chum run was over 3-1/2 times the red return. The Ungalikthluk Bay area was opened for two days on July 15-17 in an attempt to harvest the large chum run in that system. The opening was partially successful, and points out the need to investigate methods whereby the harvest rate of chum salmon can be increased and at the same time allow needed protection to red salmon stocks.

Another major problem involved in management of the Togiak district red salmon stocks is the lapse of approximately 7 to 14 days from the time the fish enter the river until they pass the tower and are counted. Aerial surveys to predict daily escapements is a major management tool in the Togiak district. Although it is often difficult to evaluate aerial sightings of fish in terms of actual escapement levels, the aerial survey program has been of great value in determining escapement trends, which in turn form the basis for management decisions on the amount of fishing time to be allowed.

Weather was not a limiting factor for the fishery in the Togiak district in 1968.

Age composition of the red salmon catch and escapement combined was 32% 4-year fish from the 1964 parent year escapement, 61% 5-year fish from 1963 and 6% 6-year fish from 1962 (Figure 7 and Appendix Table 29).

Catch

The Togiak district commercial catch for all species of salmon was 231,000, representing 4% of the total Bristol Bay catch for 1968 (Table 10). This catch was 3% higher than the 15-year average of 224,000 for the district (Appendix Table 7). The Togiak River section accounted for 169,000 fish while Osviak-Matogak and Kulukak sections contributed 55,000 and 6,000 respectively (Tables 11, 12 and 13). The Osviak-Matogak sections are primarily chum salmon fisheries, while the Kulukak section fishery is about evenly divided between red and chum salmon. Chum salmon accounted for over 86% of the Osviak-Matogak commercial catch, and was the largest catch since the inception of this fishery in 1966.

The 1968 red salmon catch of 73,000 was 40% below the 15-year average of 121,000 (Appendix Table 2). Red salmon contributed 31% of the total district harvest in 1968, with the majority (90%) coming from the Togiak River section (Tables 11, 12 and 13). Age composition of the district red salmon catch was 21% 4-year fish from the 1964 parent year escapement, 71% 5-year fish from 1963 and 8% 6-year fish from 1962 (Figure 7). Sex ratio of the commercial catch was 37% males and 63% females (Appendix Table 23). Average weight of reds sampled randomly throughout the season was 7.0 pounds, the largest in Bristol Bay in 1968 (Appendix Table 22).

The harvest of over 13,000 king salmon was the largest in the history of the fishery, although comparable with 1967, and was 83% higher than the 15-year average catch of 7,000 (Appendix Table 3). The Togiak king catch accounted for over 13% of the total Bay catch in 1968 (Table 14). As in previous years, over 95% of the king harvest was taken in the Togiak River section (Tables 11, 12 and 13). Age analysis of the commercial catch of kings revealed that the major age classes were: 37% 4-year fish from the 1964 parent year escapement, 17% 5-year fish from 1963, 26% 6-year fish from 1962 and 17% 7-year fish from 1961. Sex ratio of the commercial catch was 71% males and 29% females. Average weight of kings sampled from the catch was 25.4 pounds (Appendix Table 22).

The total catch of 108,000 chum salmon was the sixth largest in the history of the fishery and 21% higher than the average catch of 89,000 for the past 15 years (Appendix Table 4). The chum salmon catch was evenly divided between the Togiak River section (57,000) and the Osviak-Matogak section (48,000) (Tables 11 and 12). Over 83% of the chums were 4-year fish from the 1964 parent year escapement, while sampling indicated that the average weight was 7.4 pounds (Appendix Table 22). Sex ratio of the commercial catch was 42% males and 58% females.

Late season catches of coho salmon totaled 25,000, which was the largest catch in the history of the fishery. The 1968 catch was 327% higher than the 15-year average catch of 6,000, and 27% higher than the past 3 years average catch of 20,000, the period when extensive late-season fishing was conducted (Appendix Table 6). In 1968 most of the coho salmon catch was dry-salted and marketed in Japan. Average weight as determined from processor's catch reports in 1968 was 8.8 pounds.

The even-year pink salmon catch of 12,000 was the second largest harvest since the inception of the district fishery in 1954 (Appendix Table 5). Pink salmon are taken with 5-3/8 inch red salmon nets in the Togiak district and no effort with smaller mesh pink salmon nets is expended toward this species.

Escapement

A counting tower was again maintained on the Togiak River to enumerate red salmon escapement into the Togiak Lake, while red, king, chum and coho salmon escapements in the remainder of the Togiak district were estimated by use of aerial surveys.

The Togiak River red salmon escapement goal for 1968 of 110,000 was not achieved in view of the poor return of 129,000 fish (Table 2). Togiak River escapement of 43,000 reds accounted for 76% of the district escapement, while Kulukak and Togiak tributaries contributed 7,000 reds each to the district escapement, both of which fell into the lower end of the desired escapement range (Tables 1 and 2). Total red escapement to the district of 56,000 was 50% lower than the 18-year average of 111,000 (Appendix Table 18). Age composition of the red salmon escapement was 47% 4-year fish from the 1964 parent year escapement, 49% 5-year fish from 1963 and 4% 6-year fish

from 1962 (Figure 7). Sex ratio of the red escapement was 56% males and 44% females (Appendix Table 23).

King salmon escapement, which was the largest on record, was estimated to be approximately 12,000 to 15,000, with the majority (95%) of the fish spawning in the main Togiak River and connecting tributaries.

Chum salmon aerial surveys of eight streams in the western portion of the district (west of Togiak River) produced an escapement estimate of 77,000 or 22% of the total district chum escapement. Togiak River and five connecting tributaries received a spawning escapement of 230,000 chums or 66% of the district escapement. Togiak River alone received 164,000 chums, the largest observed escapement in that river system since the inception of surveys in 1959. Six streams east of the Togiak River contributed 41,000 spawning chums or 12% of the district total. Total estimated chum salmon escapement for the entire district was 348,000, the largest on record.

Late season aerial surveys produced an estimated escapement of 12,000 to 15,000 coho salmon for the Togiak River system, the only area surveyed.

OTHER FISHERIES

HERRING FISHERY

The herring resource was utilized in two ways in Bristol Bay in 1968; processing for sac-roe and harvesting herring spawn on kelp.

The Togiak district herring sac-roe fishery was conducted for the second year, with two commercial operators engaged in sac-roe processing (Table 19). The gill net and purse seine catch totaled 182,000 pounds over the two-week long fishery, and is compared with catches made in 1967 in Table 18.

Random samples (673) of the commercial catch showed that the Togiak herring were primarily age 6 through 11 (94%), which is relatively old when compared to other herring stocks on the Pacific coast. In addition, the Togiak herring were both larger (average weight 334 grams) and longer (average length 286 millimeters) than other comparable stocks along the Pacific coast. The high proportion of older age groups (6 to 11) and the low percentage (2%) of younger age groups (2 through 5) is characteristic of an unexploited population.

The 1968 herring sac-roe fishery was not overly profitable to the processors involved. The fishery was estimated to be worth $13,000, at first wholesale value, with the processor receiving $1.50 per pound for the finished product. Three primary reasons for the low economic return from the sac-roe fishery were: (1) low market price ($1.50 per pound); (2) low percentage of egg recovery (6.2%), and (3) high cost of operating in the area.

The low egg recovery of 6.2% from the total poundage caught resulted from a high number of males in the catch (80%). The extent and timing separation of the sexes, as well as the time of spawning will require further investigation to reduce the high proportion of males caught. Many of the "herring" schools observed on aerial flights, later were confirmed to be capelin smelt, Mallotus villosus. The extent to which this species has been mistaken for herring in the past is an unknown factor in estimating the herring available for utilization.

The roe-on-kelp harvest, which took place in Eagle Bay of the Togiak district, resulted in a harvest of 56,400 pounds of roe on rockweed kelp. Kelp samples were collected and two species of kelp were identified: rockweed, Fucus furcatus, and sugar wrack, Laminaria saccharina. Although both occur in large quantities, neither type is highly desirable on the Japanese market. The thickness of egg deposition on the kelp is an important factor in its marketing quality. The rockweed kelp, Fucus, accumulated eggs 1/4 to 1/2 inch thick, while the sugar wrack, Laminaria, which unlike the rockweed kelp grows in deeper water, acquired a deposition of only 1 or 2 egg layers thick.

Roe-on-kelp was harvested at low water with garden rakes and by hand, and later brined in wooden barrels. The estimated first wholesale value of the roe-on-kelp fishery was $23,000. At the time of publication of this report, much of the finished product had not been sold.

SUBSISTENCE FISHERY

Present day salmon subsistence requirements in Bristol Bay are much less than in the past when a greater dependence upon natural resources existed for everyday living. There are, however, areas in Bristol Bay where subsistence fish utilization is still important to the local inhabitants. The only areas where substantial subsistence fishing still takes place are the Lake Iliamna-Lake Clark drainage in the Naknek-Kvichak district and the Nushagak and Togiak district drainages.

Subsistence catch records are available since 1963, and although some of the data is limited, the average subsistence salmon catch in the three primary districts is: Naknek-Kvichak 65,000; Nushagak 56,000 and Togiak 15,000, with a total Bay average subsistence catch of approximately 136,000 fish (Appendix Table 34). Therefore, during some years in certain systems the subsistence requirements may exceed the total spawning population. It is, therefore, necessary for the management biologist to consider subsistence requirements when setting escapement goals on systems where low returns are forecast.

In 1968, the subsistence salmon catch was over 121,000 fish for the two major districts (Naknek-Kvichak and Nushagak), which was an average catch when compared with the mean catch from 1963 through 1968 (Appendix Table 34). Red salmon have accounted for over 80% of the Bristol Bay subsistence catch for the years catches have been recorded. In the Nushagak district, other species of salmon are important, with over 35% of the recorded subsistence catch being made-up of king, chum, pink and coho salmon (Appendix Table 34). In the Naknek-Kvichak district red salmon account for over 96% of the catch.

FISHERY BY-PRODUCTS

The salmon egg industry has continued to grow in Bristol Bay from a small scale basis in 1966 to a million dollar enterprise in 1968. Salmon eggs were processed at eight shore-based canneries in 1968, with the total production amounting to 585,000 pounds valued at over $705,000, first wholesale value (Table 17).

The salmon egg enterprise is conducted by Japanese and American firms who export the finished product to Japan for human consumption. The wholesale price in Japan for salted salmon eggs as of April 1969, was applied to the total egg production by species: reds, $1.49 per pound; kings, cohos and pinks, $1.58 per pound and chums $1.89 per pound. Using the value per pound by species, the estimated wholesale value in Japan was $949,000.

MISCELLANEOUS

Five freshwater commercial permits were issued in 1968 for exploratory fishing in four different lake systems of Bristol Bay. However, only two of the five fishermen issued permits actually conducted exploratory work. One fisherman fished Okstukuk Lake, a small lake heading the Kokwok River of the Nushagak River system. Fishing was conducted for two months with the catch amounting to 4,600 pounds of fish, most of which (95%) were whitefish. Nunavaugaluk Lake (Snake River Lake) of the Nushagak district was fished on an exploratory basis for two days by one fisherman in the late fall. The catch of less than 100 fish consisted primarily of Arctic char and whitefish.

Another rapidly growing enterprise in the Bristol Bay commercial fishery is the dry-salting of salmon for Japanese markets. In 1968 over 882,000 pounds of red, chum and coho salmon were dry-salted and shipped direct to Japan. The total production by this method of processing was estimated to be worth approximately $456,000 (first wholesale value), while it was further estimated that the total 1968 dry-salted production was worth $497,000 in Japan, based on current market prices.

Fresh-frozen production of king salmon amounted to over 503,000 pounds, and was estimated to be worth $251,000, first wholesale value.

LITERATURE CITED

1. Alaska Department of Fish and Game. 1960-1968. Division of Commercial Fisheries, Bristol Bay Management and Research Staff, unpublished records.

2. _____. 1960-1968. Division of Administration, Statistics Section, unpublished records.

3. _____. 1960-1967. Annual "Alaska Catch and Production Commercial Fisheries Statistics". Div. of Administration, Statistics Section, Statistical Leaflet No.'s 1, 3, 5, 7, 9, 11, 13 and 15.

4. _____. 1963-1968. Annual Bristol Bay Red Salmon Data Compilations, Division of Commercial Fisheries, Research Section, Informational Leaflets No.'s 35, 45, 75, 94, 121 and 1968 report in press.

5. Fisheries Research Institute. 1951-1960. University of Washington Staff, unpublished records.

6. _____. 1963. Statistical Records and Compilations on Red Salmon Runs to the Nushagak District, Bristol Bay, Alaska, 1946-59 by O.A. Mathisen, et al., Special Scientific Report - Fisheries No. 468.

7. _____. 1963. Tabulated Information on Red Salmon Runs to the Ugashik System, Bristol Bay, Alaska, 1946-57, by O.E. Kerns, Jr., Circular No. 184.

8. International North Pacific Fisheries Commission. 1952-1967. Annual Statistical Yearbooks.

9. _____. 1968. Information on Recent Changes in the Salmon Fisheries of Alaska and the Condition of Stocks by R.A. Fredin, et. al., INPFC Document 1134.

10. Pacific Fisherman Annual Yearbooks, 1951-1966.

11. U.S. Bureau of Commercial Fisheries. 1956-1968. Bristol Bay Research Staff, unpublished records.

12. _____. 1960. Alaska Commercial Salmon Catch Statistics, 1951-1959 by R.R. Simpson. Statistical Digest No. 50.

13. ———————————————————. 1953. Alaska Fisheries & Fur-Seal Industries, Statistical Digest No. 31.

14. ———————————————————. 1951-1959. Annual Agent Reports for Bristol Bay by Fishery Management Agents.

15. U. S. Bureau of Commercial Fisheries. 1967-1968. Daily Fishery Products Report, Seattle.

TABLE 1. Summary of Bristol Bay red salmon catch and escapement, 1968.[1/]

District	Escapement System	Escapement District	Catch	Total Run
NAKNEK-KVICHAK DISTRICT				
Kvichak River	2,557,440			
Naknek River	1,023,222			
Alagnak River	193,872			
		3,774,534	1,216,858	4,991,392
EGEGIK DISTRICT		338,654	671,554	1,010,208
UGASHIK DISTRICT		70,896	82,457	153,353
NUSHAGAK DISTRICT				
Wood River	649,344			
Igushik River	194,508			
Snake River	4,100			
Tikchik Lakes (Nuyakuk)	96,642			
Nush.-Mulchatna System	32,070			
		976,664	749,281	1,725,945
TOGIAK DISTRICT				
Togiak River	42,918			
Togiak Tributaries	7,000			
Kulukak System	6,500			
		56,418	72,699	129,117
TOTAL BRISTOL BAY		5,217,166	2,792,849	8,010,015

1/ Final catch and escapement data.

TABLE 2. Summary of Bristol Bay red salmon forecast and escapement goals, 1968.

District	Forecasted Run[1/]	Escapement	
		1968 Goal	Management Escapement Range
NAKNEK-KVICHAK DISTRICT			
Kvichak River	874,000	874,000	500,000-3,500,000
Naknek River	2,295,000	1,000,000	800,000-1,200,000
Alagnak (Branch) River	577,000	577,000	200,000- 800,000
Total	3,746,000	2,451,000	1,500,000-5,500,000
EGEGIK DISTRICT	2,093,000	1,000,000	800,000-1,200,000
UGASHIK DISTRICT[2/]	1,050,000	750,000	700,000-1,000,000
NUSHAGAK DISTRICT			
Wood River	2,536,000	1,000,000	700,000-1,200,000
Igushik River	272,000	150,000	150,000- 250,000
Snake River	50,000	50,000	10,000- 40,000
Nuyakuk River	400,000	200,000	100,000- 250,000
Nushagak-Mulchatna	40,000	20,000	20,000- 50,000
Total	3,298,000	1,420,000	980,000-1,790,000
TOGIAK DISTRICT			
Togiak River	222,000	110,000	80,000- 120,000
Togiak Tributaries	20,000[3/]	10,000	5,000- 15,000
Kulukak System	15,000[3/]	10,000	5,000- 15,000
Total	257,000	130,000	90,000- 150,000
TOTAL JOINT PREDICTION	10,409,000	5,751,000	4,070,000-9,640,000
TOTAL BAY PREDICTION	10,444,000		

1/ Bristol Bay red salmon forecast of run for 1968. Alaska Department of Fish and Game, Informational Leaflet 123; north side of Alaska Peninsula run not included.

2/ Excluding Mother Goose system run.

3/ System forecast by Alaska Department of Fish and Game; not included in joint Bristol Bay forecast.

TABLE 3. Bristol Bay pre-season gear registration by district and type of gear, 1968.[1/]

District	Type of Gear[2/] Drift	Set	Total
NAKNEK-KVICHAK			
Resident	262	271	533
Non-resident	410	23	433
TOTAL	672	294	966
EGEGIK			
Resident	116	144	260
Non-resident	169	55	224
TOTAL	285	199	484
UGASHIK			
Resident	50	62	112
Non-resident	23	16	39
TOTAL	73	78	151
NUSHAGAK			
Resident	446	234	680
Non-resident	108	23	131
TOTAL	554	257	811
TOGIAK			
Resident	99	11	110
Non-resident	1	0	1
TOTAL	100	11	111
BRISTOL BAY			
Resident	973	722	1,695
Non-resident	711	117	828
TOTAL	1,684	839	2,523

1/ Based upon gear license count - registration at start of season - does not incorporate district transfers.

2/ Legal gear in 1968 amounted to 75 fathoms for drifters and 25 fathoms for set netters.

TABLE 4. Bristol Bay emergency order fishing periods by district, 1968.[1/]

NAKNEK-KVICHAK DISTRICT

Date & Time	Hours
NAKNEK SECTION ONLY:	
June 17 4 pm - June 19 4 pm	48
June 21 6 am - June 22 6 am	24
June 24 9 am - June 25 9 am	24
June 27 11 am - June 27 11 pm	12
June 29 12 am - June 29 12 am	12
July 2 3 am - July 2 3 pm	12
July 5 4 am - July 5 4 pm	12
July 5 4 pm - July 6 4 am	12
July 6 4 am - July 11 10 am	126
NAKNEK AND KVICHAK SECTIONS:	
July 11 10 am - July 12 10 am	24
July 12 10 am - July 13 9 am	23
TOTAL HOURS[2/]	329

NUSHAGAK DISTRICT

Date & Time	Hours
NUSHAGAK SECTION:	
June 17 5 pm - June 18 5 pm	24
June 21 8 am - June 22 8 am	24
June 25 10 am - June 26 12 am	26
June 30 3 am - June 30 3 pm	12
July 10 10 am - July 11 10 am	24
July 11 10 am - July 13 9 am	47
July 15 9 am - July 20 9 am	5 days
July 21 9 am - Aug. 3 9 am	13 days
Aug. 3 9 am - Aug. 10 9 am	7 days
IGUSHIK SECTION ONLY:	
June 28 2 am - June 28 2 pm	12
July 2 4 pm - July 3 4 am	12
July 4 6 pm - July 5 6 pm	24
July 5 6 pm - July 7 12 am	42
July 8 12 am - July 10 10 am	46
TOTAL HOURS[2/]	293

UGASHIK DISTRICT

Date & Time	Hours
June 17 3 pm - June 19 3 pm	48
June 21 6 am - June 22 6 am	24
June 24 8 am - June 25 8 am	24
June 27 10 am - June 28 10 am	24
June 30 12 am - July 1 12 am	24
July 3 3 pm - July 4 3 pm	24
July 7 6 am - July 8 6 am	24
July 15 9 am - July 16 9 am	24
July 18 9 am - July 20 9 am	48
TOTAL HOURS[2/]	192

EGEGIK DISTRICT

Date & Time	Hours
June 17 3 pm - June 19 3 pm	48
June 21 5 am - June 22 5 am	24
June 24 8 am - June 25 8 am	24
June 27 10 am - June 27 10 pm	12
June 30 12 am - June 30 12 am	12
July 4 4 am - July 4 4 pm	12
July 15 9 am - July 16 9 am	24
July 18 9 am - July 20 9 am	48
TOTAL HOURS[2/]	132

TOGIAK DISTRICT*

Date & Time	Hours
June 17 9 am - June 21 9 am	96
June 24 9 am - June 28 9 am	96
July 1 9 am - July 5 9 am	96
July 8 9 am - July 10 9 am	48
July 17 9 am - July 19 9 am	48
July 22 9 am Back on four days per week.	

*The Togiak and Kulukak sections were open for fishing four days per week except for a seven day closure of the Togiak section from July 10 to July 17. The Osviak and Matogak sections were open five days per week while the Cape Pierce section was open seven days per week beginning June 5. The Ungalikthlul section was open for a 48-hour period beginning July 15.

1/ Emergency order period extended from midnight, June 16 to 9 am July 13.
2/ Hours fished only during emergency order period.

TABLE 5. Bristol Bay fishing gear by district and period, 1968.[1/]

NAKNEK-KVICHAK DISTRICT

Period	Number		
	Drift Net	Set Net	Total
6/10-15	1	4	5
6/17-19[2/]	131	101	232
6/21-22[2/]	195	86	281
6/24-25[2/]	334	109	443
6/27[2/]	436	110	546
6/29[2/]	419	100	519
7/2 [2/]	452	134	586
7/5-7[2/]	504	156	660
7/8-11[3/]	552	169	721
7/11-13	439	146	585
7/15-20	268	128	396
7/22-27	57	34	91
7/29-8/3	71	38	109
8/5-24	67	35	102

UGASHIK DISTRICT

Period	Number		
	Drift Net	Set Net	Total
6/3-8	4	0	4
6/10-15	9	1	10
6/17-19	22	16	38
6/21-22	40	18	58
6/24-25	47	31	78
6/27-28	50	35	85
6/30-7/1	52	33	85
7/3-4	54	34	88
7/7-8	53	36	89
7/15-16	52	32	84
7/18-20	36	10	46
7/22-27	29	5	34
7/29-8/3	1	0	1
8/5-9/14	13	11	24

TOGIAK DISTRICT

Period	Number		
	Drift Net	Set Net	Total
6/10-14	39	0	39
6/17-21	81	0	81
6/24-29	95	3	98
7/1-6	96	4	100
7/8-13	95	2	97
7/15-20	96	0	96
7/22-27	58	0	58
7/29-8/3	55	0	55
8/5-10	3	0	3
8/21-17	39	0	39
8/19-24	51	4	55
8/26-31	46	4	50
9/2-7	46	0	46

EGEGIK DISTRICT

Period	Number		
	Drift Net	Set Net	Total
6/10-15	28	8	36
6/17-19	170	77	247
6/21-22	240	85	325
6/24-25	272	99	371
6/27	277	74	351
6/30	294	100	394
7/4	278	112	390
7/15-16	66	77	143
7/18-20	0	2	2
7/22-27	0	1	1
7/29-8/3	0	2	2
8/5-9/7	3	14	17

NUSHAGAK DISTRICT

Period	Number		
	Drift Net	Set Net	Total
5/31-6/1	66	2	68
6/3-8	222	3	225
6/10-15	326	11	237
6/17-18	293	14	307
6/21-22	394	103	497
6/25-26	461	123	584
6/28[4/]	373	52	425
6/30	455	111	566
7/2-3[4/]	451	54	505
7/4-7[4/]	461	57	518
7/8-13	493	144	637
7/15-20	571	144	715
7/21-27	542	94	636
7/28-8/3	279	84	363
8/4-10	131	71	202
8/12-17	62	21	83
8/19-24	15	3	18
8/26-31	1	3	4
9/2-7	1	2	3
9/9-14	1	1	2

1/ Based on individual deliveries from fish ticket tabulations.
2/ Naknek section only.
3/ Naknek-Kvichak district opened at 10 am on July 11.
4/ Igushik section only.

TABLE 6. Naknek-Kvichak district catch by species and period, 1968.[1/]

Period	Hours	Catch by Species					
		Reds	Kings	Chums	Pinks	Cohos	Total
6/10-15	5 days	35	24				59
6/17-19[2/]	48	4,099	314	205			4,618
6/21-22[2/]	24	2,053	132	12			2,197
6/24-25[2/]	24	47,513	278	366			48,157
6/27 [2/]	12	184,690	414	1,224			186,328
6/29 [2/]	12	163,610	138	4,786			168,534
7/2 [2/]	12	150,385	231	923			151,539
7/5-7[2/]	68	342,231	887	1,134	2		344,254
7/8-11[3/]	92	221,241	1,744	18,260	1		241,246
7/11-13	47	66,176	1,026	5,377	1		72,580
7/15-20	5 days	19,777	673	4,582	2,289		27,321
7/22-27	5 days	12,411	317	3,965	44,575	280	61,548
7/29-8/3	5 days	2,597	137	703	110,419	1,183	115,039
8/5-9/24		40	83	1,650	61,445	5,894	69,112
Totals		1,216,858	6,398	43,187	218,732	7,357	1,492,532
Percent of District Catch		81.5	0.4	2.9	14.7	0.5	100.0

1/ Kvichak section closed to fishing throughout majority of field announcement period, June 17-July 13.

2/ Naknek section only.

3/ Naknek-Kvichak district opened at 10 am on July 11.

TABLE 7. Egegik district catch by species and period, 1968.

Period	Hours	Catch by Species					
		Reds	Kings	Chums	Pinks	Cohos	Total
6/10-15	5 days	1,054	661				1,715
6/17-19	48	15,743	834	44			16,621
6/21-22	24	19,908	612	643			21,163
6/24-25	24	82,904	582	2,952			86,438
6/27	12	150,721	406	4,941			156,068
6/30	12	215,220	198	2,839			218,257
7/4	12	180,836	153	3,834			184,823
7/15-16	24	4,576	26	833	8		5,443
7/18-20	48	316		63	9	5	393
7/22-27	5 days	131		23	140	33	327
7/29-8/3	5 days	123		20	51	805	999
8/5-9/7		22		1	3	5,664	5,690
Totals		671,554	3,472	16,193	211	6,507	697,937
Percent of District Catch		96.2	0.5	2.3	+	1.0	100.0

TABLE 8. Ugashik district catch by species and period, 1968.

Period	Hours	Catch by Species					
		Reds	Kings	Chums	Pinks	Cohos	Total
6/3-8	5 days		79				79
6/10-15	5 days	37	581	2			620
6/17-19	48	603	307	15			925
6/21-22	24	1,163	220	57			1,440
6/24-25	24	3,264	152	29			3,445
6/27-28	24	12,598	201	1,157			13,956
6/30-7/1	24	9,561	223	1,451			11,235
7/3-4	24	18,031	128	2,292			20,451
7/7-8	24	22,078	99	3,043			25,220
7/15-16	24	8,300	70	2,118			10,488
7/18-20	48	5,466	45	2,548		12	8,071
7/22-27	5 days	1,356	48	4,912		0	6,316
7/29-8/3	5 days					23	23
8/5-9/14						5,736	5,736
Totals		82,457	2,153	17,624		5,771	108,005
Percent of District Catch		76.4	2.0	16.3		5.3	100.0

TABLE 9. Nushagak district catch by species and period, 1968.

Period	Hours	Catch by Species					
		Reds	Kings	Chums	Pinks	Cohos	Total
5/31-6/1	2 days		4,922				4,922
6/3-8	5 days	9	6,828	1			6,838
6/10-15	5 days	214	25,389	66	2		25,671
6/17-18	24	337	9,491	319	1		10,148
6/21-22	24	8,518	15,810	8,195	8		32,531
6/25-26	26	152,550	3,524	28,420	15		184,509
6/28[1/]	12	60,400	498	786	7		61,691
6/30	12	266,614	6,353	58,292	30		331,289
7/2-3[1/]	12	41,940	260	165	3		42,368
7/4-7[1/]	66	87,877	1,491	3,372	36		92,776
7/8-13	5 days	97,803	2,493	48,422	5,671	10	154,399
7/15-20	5 days	14,726	706	16,006	600,231	2,410	634,079
7/21-27	7 days	13,729	327	14,118	823,537	14,662	866,373
7/28-8/3	7 days	2,904	79	330	254,633	9,671	267,617
8/4-10	6 days	1,640	21	231	20,156	13,092	35,140
8/12-17	5 days	20	9	63	820	7,204	8,116
8/19-24	5 days					1,249	1,249
8/26-31	5 days					272	272
9/2-7	5 days					252	252
9/9-14	5 days					45	45
Totals		749,281	78,201	178,786	1,705,150	48,867	2,760,285
Percent of District Catch		27.1	2.8	6.5	61.8	1.8	100.0

1/ Igushik section only.

TABLE 10. Togiak district catch by species and period, 1968.[1/]

Period	Hours	Catch by Species					
		Reds	Kings	Chums	Pinks	Cohos	Total
6/10-14	4 days	106	1,064	4			1,174
6/17-21	4 days	1,159	3,560	230	4		4,953
6/24-29	5 days	18,351	5,666	15,587	359		39,963
7/1-6	5 days	21,748	2,047	29,040	558		53,393
7/8-13	5 days	11,704	772	27,446	801		40,723
7/15-20	5 days	9,892	295	18,919	2,441		31,547
7/22-27	5 days	7,232	79	14,161	4,187	22	25,681
7/29-8/3	5 days	2,442	12	2,614	3,393	58	8,519
8/5-10	5 days	0	0			63	63
8/12-17	5 days	65	4			2,472	2,541
8/19-24	5 days					8,228	8,228
8/26-31	5 days					8,632	8,632
9/2-7	5 days					5,397	5,397
Totals		72,699	13,499	108,001	11,743	24,872	230,814
Percent of District Catch		31.5	5.8	46.8	5.1	10.8	100.0

1/ Includes catches of Togiak River, Osviak-Matogak and Kulukak sections.

TABLE 11. Togiak River section catch by species and period, 1968.[1/]

Period	Hours	Catch by Species					
		Reds	Kings	Chums	Pinks	Cohos	Total
6/10-14	4 days	93	1,057	4			1,154
6/17-21	4 days	1,161	3,526	228	4		4,919
6/24-28	4 days	17,048	5,507	6,538	236		29,329
7/1-5	4 days	19,831	1,921	16,073	442		38,267
7/8-10	2 days	9,866	641	10,948	358		21,813
7/17-19	2 days	8,317	236	12,126	1,897		22,576
7/22-26	4 days	6,652	44	8,592	3,488	7	18,783
7/29-8/2	4 days	2,442	12	2,614	3,393	58	8,519
8/5-9	4 days	0	0			63	63
8/12-16	4 days	65	4			2,472	2,541
8/19-23	4 days					7,371	7,371
8/26-30	4 days					8,682	8,682
9/2-6	4 days					5,397	5,397
Totals		65,475	12,948	57,123	9,818	24,050	169,414
Percent of Section Catch		38.7	7.6	33.7	5.8	14.2	100.0

1/ Includes 48-hour fishing period in Ungalikthluk section from 9 a.m. Monday, July 15 to 9 a.m. Wednesday, July 17.

TABLE 12. Osviak-Matogak section catch by species and period, 1968.

Period	Hours	Catch by Species					
		Reds	Kings	Chums	Pinks	Cohos	Total
6/24-29	5 days	809	107	8,426	116		9,458
7/1-6	5 days	1,073	100	12,016	107		13,296
7/8-13	5 days	1,149	119	15,949	377		17,594
7/15-20	5 days	995	51	5,763	394		7,203
7/22-27	5 days	580	35	5,569	699	15	6,898
8/19-24	5 days					807	807
Totals		4,606	412	47,723	1,693	822	55,256
Percent of Section Catch		8.3	0.7	86.4	3.1	1.5	100.0

TABLE 13. Kulukak section catch by species and period, 1968.

Period	Hours	Catch by Species					
		Reds	Kings	Chums	Pinks	Cohos	Total
6/17-21	4 days	11	41	2			54
6/24-28	4 days	494	52	623	7		1,176
7/1-5	4 days	844	26	951	9		1,830
7/8-12	4 days	689	12	549	66		1,316
7/15-19	4 days	580	8	1,030	150		1,768
Totals		2,618	139	3,155	232	0	6,144
Percent of Section Catch		42.6	2.3	51.3	3.8	0.0	100.0

TABLE 14. Summary of Bristol Bay commercial catch by district and species, 1968.1/

District and Subdistrict	Catch by Species					Total
	Reds	Kings	Chums	Pinks	Cohos	
NAKNEK-KVICHAK						
Kvichak	387,565					
Branch	61,111					
Naknek	768,182					
TOTAL	1,216,858	6,398	43,187	218,732	7,357	1,492,532
EGEGIK	671,554	3,472	16,193	211	6,507	697,937
UGASHIK	82,457	2,153	17,624	-	5,771	108,005
NUSHAGAK						
Wood	208,387					
Igushik	189,273					
Snake	-					
Nuyakuk	271,183					
Nush.-Mulchat.	80,438					
TOTAL	749,281	78,201	178,786	1,705,150	48,867	2,760,285
TOGIAK	72,699	13,499	108,001	11,743	24,872	230,814
TOTALS	2,792,849	103,723	363,791	1,935,836	93,374	5,289,573

1/ Apportionment of the inshore red salmon catch by river system to the Naknek-Kvichak and Nushagak districts is preliminary.

Species	Percent of Season Total
Reds	52.8
Kings	2.0
Chums	6.9
Pinks	36.6
Cohos	1.7

TABLE 15. Bristol Bay catch by district, type of gear, and species, 1968.

District	Type Gear	Catch and Percent by Species											
		Reds	%	Kings	%	Chums	%	Pinks	%	Cohos	%	Total	%
NAKNEK-KVICHAK	Drift	1,085,315	89	5,201	81	35,411	82	146,370	67	2,893	39	1,275,190	85
	Set	131,543	11	1,197	19	7,776	18	72,362	33	4,464	61	217,342	15
	TOTALS	1,216,858		6,398		43,187		218,732		7,357		1,492,532	
EGEGIK	Drift	627,428	93	3,191	92	15,101	93	5	2	93	1	645,818	93
	Set	44,126	7	281	8	1,092	7	206	98	6,414	99	52,119	7
	TOTALS	671,554		3,472		16,193		211		6,507		697,937	
UGASHIK	Drift	66,333	80	1,917	89	14,566	83	0	0	4,729	82	87,545	81
	Set	16,124	20	236	11	3,058	17	0	0	1,042	18	20,460	19
	TOTALS	82,457		2,153		17,624		0	0	5,771		108,005	
NUSHAGAK	Drift	674,284	90	77,369	99	173,977	97	1,557,661	91	38,666	79	2,521,957	91
	Set	74,997	10	832	1	4,809	3	147,489	9	10,201	21	238,328	9
	TOTALS	749,281		78,201		178,786		1,705,150		48,867		2,760,285	
TOGIAK	Drift	71,590	99	13,459	100	106,078	98	11,725	100	24,427	98	227,279	98
	Set	1,109	1	40	+	1,923	2	18	+	445	2	3,535	2
	TOTALS	72,699		13,499		108,001		11,743		24,872		230,814	
TOTALS	Drift	2,524,950	90	101,137	98	345,133	95	1,715,761	89	70,808	76	4,757,789	90
	Set	267,899	10	2,586	2	18,658	5	220,075	11	22,566	24	531,784	10
	TOTALS	2,792,849		103,723		363,791		1,935,836		93,374		5,289,573	

TABLE 16. Bristol Bay salmon case pack by species and company, 1968.[1/]

Name of Company	Pack by Species					
	Reds	Kings	Chums	Pinks	Cohos	Totals
			CASE PACK			
Alaska Packers Association	78,380	1,075	3,822	4	0	83,281
Bering Sea Processors	1,908	154	776	6,597	486	9,921
Bumble Bee Seafoods	42,685	1,036	3,993	70	0	47,784
Columbia Wards Fisheries	34,696	9,096	8,522	32,661	2,235	87,210
Kayak Packing Company	2,979	33	993	2,318	38	6,361
Nelbro Packing Company	25,136	746	1,100	47	0	27,029
Pacific Alaska Fisheries	24,569	6,111	7,310	30,859	1,256	70,105
Togiak Fisheries	4,047	541	7,386	496	0	12,470
Queen Fisheries	0	0	0	35	306	341
TOTALS	214,400	18,792	33,902	73,087	4,321	344,502
			FRESH-FROZEN OR SALTED			
Alaskan Smokey Joe's	30,509	3,644	2,252	127	44,462	80,994
B&R Sales	1,636	9	23	-	202	1,870
Bering Sea Processors	-	-	13	139	197	349
Bristol Bay Processors	927	18	-	176	2,188	3,309
Clark Fish & Pack	191	9	5	-	-	205
Coffee Point Saltry	70	-	45	27	1,473	1,615
Digon Co. (M/V Big Dipper)	-	1,014	-	-	-	1,014
Fortune Foods, Inc. (M/V Victor H.)	-	2,833	-	-	-	2,833
Mickey Jones (M/V Brown Bear)	17,473	1,072	7,670	-	-	26,215
S. Leland Daniels (M/V Christian)	129	3,449	105	-	-	3,683
Theodore Seafoods (M/V Teddy)	13	5,815	26	-	-	5,854
Togiak Fish., Inc.	5,785	4,721	10,042	-	-	20,548
TOTALS	56,733	22,584	20,181	469	48,522	148,489

1/ Case pack given in 48 1-lb. cans per case, while fresh-frozen and salted is given in numbers of fish; preliminary data.

TABLE 17. Bristol Bay salmon egg production and value by company and species, 1968.[1/]

Cannery (Company)	Location	Pounds of Eggs by Species						Wholesale Value of Finished Product
		Reds	Kings	Chums	Pinks	Cohos	Totals	
A.P.A. (Toshoku, Ltd)	S. Naknek	66,374	572	12,276	0	0	79,222	$109,904
Nelbro Packing Co. (Mitsui Co.)	Naknek	32,472	1,870	4,950	0	0	39,292	42,708
Bumble Bee Seafoods (Mitsui Co.)[2/]	S. Naknek	53,394	1,584	17,182	0	0	72,160	78,654
Kayak Packing Co. (Marubeni-Iida, Inc.)	Naknek-Kvichak (Floater)	5,145	84	5,754	4,263	0	15,246	17,533
P.A.F. (W. Alas. Enterprises, Inc.)	Dillingham	30,778	18,634	28,292	27,170	2,376	107,250	160,895
C.W.F. (Mitsui Co.)[2/]	Ekuk	57,508	29,128	34,540	44,638	6,776	172,590	188,123
Togiak Fisheries (Marubeni-Iida, Inc.)[3/]	Togiak	12,338	6,983	48,337	136	0	67,794	74,573
Alaska Smokey Joe's, Inc. (Marubeni-Iida, Inc.)	Dillingham	6,858	0	1,569	451	23,004	31,882	33,476
TOTALS		264,867	58,855	152,900	76,658	32,156	585,436	$705,866

1/ Data taken from FG-122, "Alaska Fishery Operators Annual Report".

2/ Company did not file a final Annual Report on egg production, therefore, the preliminary egg production was used.

3/ Final report gave only total egg production with no breakdown by species. Final egg production by species was estimated using preliminary data applied to the final total egg production.

TABLE 18. Togiak district commercial catch of herring in pounds by type of gear, 1967-1968.

Date	Herring Catch in Pounds			
	1967	1968		
	Gill Nets	Gill Nets	Seine	Total
May 15	24,288			
16	56,394			
17	51,710	1,350	-	1,350
18	35,370	42,060	-	42,060
19	17,440	680	-	680
20	28,735	56,800	23,585	80,385
21	-	24,575	-	24,575
22	340	4,310	-	4,310
23	22,170	2,920	4,000	6,920
24	-	2,235	17,280	19,515
25	10,355	1,530	-	1,530
26	-	-	-	-
27	22,100	-	-	-
28	-	440	-	440
TOTALS	268,902	136,900	44,865	181,765

TABLE 19. Bristol Bay fishery operators by district, 1968.[1/]

Name of Operator	Location	No. Lines	Comments
	NAKNEK-KVICHAK DISTRICT		
Alaska Packers Association	South Naknek	3 - 1 lb. tall 1 - 3/4 lb. 1 - 1/2 lb.	Canned salmon
Bering Sea Processors	South Naknek	1 - 1 lb. tall 1 - 1/2 lb.	Canned salmon
Bumble Bee Seafoods	South Naknek	3 - 1 lb. tall 1 - 1/2 lb. 1 - 1/4 lb.	Canned salmon
Harold C. Ostrosky	Naknek	None	Pickled & salted salmon
Kayak Packing Co.	Kvichak Bay (M/V Kayak)	1 - 1 lb. tall	Canned salmon
Kayler-Dahl Fish Co., Inc.	Naknek	None	Operated as fish camp
Mitsui & Co., Inc.	Naknek (Nelbro & Bumble Bee)	None	Salmon roe
Nakat Packing Corporation	Nakeen	3 - 1 lb. tall 1 - 1/2 lb.	Operated as fish camp
Nelbro Packing Co.	Naknek	1 - 1 lb. tall 2 - 1/2 lb. 1 - 1/4 lb.	Canned salmon
New England Fish Co.	Peterson Point	3 - 1 lb. tall	Operated as fish camp
Pacific Alaska Fisheries, Inc	Naknek (Warren)	None	Operated as fish camp
Peter Pan Seafoods	Naknek	None	Operated as fish camp; fish transported to False Pass for canning
Red Salmon Company	Naknek	4 - lb. tall	Operated as fish camp
Toshoku, Ltd.	South Naknek (A.P.A.)	None	Salmon roe
	UGASHIK DISTRICT		
Alaska Packers Association	Ugashik	None	Operated as fish camp
Alaskan Smokey Joe's, Inc.	Ugashik	None	Salted salmon
Mickie Jones	Ugashik (M/V Polar Bear)	None	Frozen and salted salmon

(Continued)

Table 19. (Continued)

Name of Operator	Location	No. Lines	Comments
	EGEGIK DISTRICT		
Alaska Packers Association	Egegik	3 - 1 lb. talls	Operated as fish camp
Alaskan Smokey Joe's, Inc.	Egegik	None	Salted salmon
Bristol Bay Processors (Eldridge Clark)	Egegik	None	Salted salmon
Clark Fishing and Packing (Edward Clark)	Egegik	None	Salted salmon
Coffee Point Saltry	Egegik	None	Salted salmon
Columbia Wards Fisheries	N. Egegik	None	Operated as fish camp
Egegik Packing Company	Egegik	1 - 1 lb. talls 1 - 1/2 lb.	Operated as fish camp
Kayak Packing Co.	Big Creek (M/V Kayak)	1 - 1 lb. tall	Canned salmon
Marubeni-Iida, Inc.	Egegik (M/V Kayak)	None	Salmon roe
	TOGIAK DISTRICT		
Alaskan Smokey Joe's, Inc.	Togiak	None	Canned and salted salmon. Herring roe on kelp.
Bering Sea Fisheries, Inc.	Togiak (M/V Northwind)	None	Herring roe
M. Otani	Togiak	None	Herring roe on kelp
Marubeni-Iida, Inc.	Togiak (Togiak Fisheries)	None	Salmon roe
Togiak Fisheries, Inc.	Togiak	1 - 1/2 lb. 1 - 1/4 lb.	Canned and salted salmon

(Continued)

TABLE 19. (Continued)

Name of Operator	Location	No. Lines	Comments
	NUSHAGAK DISTRICT		
Alaska Packers Association	Clarks Point	None	Operated as fish camp
Alaskan Smokey Joe's, Inc.	Dillingham	None	Fresh and salted salmon. Salmon roe.
B&R Sales (W. Brennan)	Dillingham	None	Fresh salmon
Columbia Wards Fisheries	Ekuk	3 - 1 lb. talls 1 - 1/2 lb.	Canned salmon
Daniels, Leland S.	Nushagak Bay (M/V Christian)	None	Fresh salmon
Dignon Co. and Washington Fish and Oyster	Nushagak Bay (M/V Big Dipper)	None	Frozen salmon
Fortune Foods, Inc.	Nushagak Bay (M/V Victor H)	None	Frozen salmon
Gurtler, R.E.	Dillingham	None	Salted salmon
Mitsui and Co., Inc.	Ekuk (C.W.F. & Queen)	None	Salmon roe
New England Fish Co.	Dillingham	None	Operated as fish camp
Pacific Alaska Fisheries, Inc	Dillingham	2 - 1 lb. tall 1 - 1/2 lb.	Canned salmon
Queen Fisheries, Inc.	Combine Slough	1 - 1 lb. tall 1 - 1/2 lb. 1 - 1/4 lb.	Canned salmon
Theodore Seafoods, Inc.	Nushagak Bay (M/V Teddy)	None	Frozen salmon
Western Alaska Enterprises, Inc.	Dillingham (P.A.F.)	None	Salmon roe

	1 lb.	3/4 lb.	1/2 lb.	1/4 lb.
Total available lines	29	1	11	4
Total operating lines	15	1	9	4

1/ Indicates only operators with a physical plant or processing facility in a district. Most non-operating canneries are utilized as fishing bases, and several more companies may be represented with fishing effort in districts than indicated.

APPENDIX
TABLES

APPENDIX TABLE 1. Comparative Bristol Bay license statistics, 1960-1968.

	1960	1961	1962	1963	1964	1965	1966	1967	1968[1/]
COMMERCIAL FISHING LICENSES:									
Resident	1,422	2,112	1,993	2,258	2,494	2,124	2,763	1,862	2,094
Non-resident	745	1,506	933	1,344	1,231	1,674	1,501	1,560	1,243
TOTAL	2,167	3,618	2,926	3,602	3,725	3,798	4,264	3,422	3,337
VESSEL LICENSES:									
Fishing Vessels									
Resident	804	1,058	1,031	1,209	1,161	1,164	1,217	1,184	1,158
Non-resident	350	665	386	581	605	648	883	776	672
TOTAL	1,154	1,723	1,417	1,790	1,766	1,812	2,100	1,960	1,830
Scows									
Resident	22	14	30	33	15	17	20	8	9
Non-resident	28	46	19	32	35	57	43	53	20
TOTAL	50	60	49	65	50	74	63	61	29
GEAR LICENSES:									
Resident									
150 F. Drift Net	561	674	715	766	815	800	875	836	-
100 F. Drift Net	89	106	76	148	132	116	144	129	973
50 F. Set Net	345	496	619	773	793	868	826	686	722
TOTAL	995	1,276	1,410	1,687	1,740	1,784	1,845	1,651	1,695
Non-resident									
150 F. Drift Net	342	600	383	509	639	626	762	678	-
100 F. Drift Net	22	38	17	36	50	51	84	56	711
50 F. Set Net	0	10	20	116	137	125	139	144	117
TOTAL	364	648	420	661	826	802	985	878	828
Total Gear	1,359	1,924	1,830	2,348	2,566	2,586	2,830	2,529	2,523
Total Licenses Sold	4,730	7,325	6,222	7,805	8,107	8,270	9,257	7,972	7,719
Total License Revenues Collected	$72,075	$117,700	$87,725	$92,250	$113,359	$128,385	$146,265	$153,820	$127,085

1/ Maximum allowable licensed gear per licensee was 100 fathoms for drifters and 25 fathoms for set netters.

APPENDIX TABLE 2. Comparative Bristol Bay red salmon catch, by district, 1951-68.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1951	2,926,413	644,551	318,629	436,950	-	4,326,543
1952	9,401,060	886,852	280,146	698,071	-	11,266,129
1953	3,738,839	1,234,600	688,720	449,341	-	6,111,500
1954	1,819,666	1,437,791	1,067,531	315,357	12,280	4,652,625
1955	2,564,341	622,885	240,817	1,054,978	66,085	4,549,106
1956	5,987,750	1,187,099	341,499	1,263,186	101,933	8,881,467
1957	4,578,643	814,459	350,858	491,498	40,044	6,275,502
1958	922,611	500,684	433,813	1,092,156	36,402	2,985,666
1959	1,689,425	662,391	423,414	1,719,687	113,202	4,608,119
1960	9,847,848	1,446,884	752,634	1,517,988	139,648	13,705,002
1961	8,166,983	2,686,076	357,223	511,483	192,161	11,913,926
1962	2,281,284	638,862	243,159	1,461,766	92,945	4,718,016
1963	957,902	695,582	188,695	842,744	186,213	2,871,136
1964	2,243,701	1,103,935	576,768	1,420,941	250,775	5,596,120
1965	19,139,567	3,179,559	925,690	793,323	217,100	24,255,239
1966	5,397,538	2,101,174	445,458	1,170,271	199,799	9,314,240
1967	2,337,226	1,070,942	163,744	657,711	101,107	4,330,730
1968	1,216,858	671,554	82,457	749,281	72,699	2,792,849
18-Year Total	85,217,655	21,585,880	7,881,255	16,646,732	1,822,393	133,153,915
18-Year Average	4,734,341	1,199,216	437,848	924,818	121,493[1]/	7,397,440

1/ 15-year average for Togiak district.
(Data Source: 2, 8 and 12)

APPENDIX TABLE 3. Comparative Bristol Bay king salmon catch, by district, 1951-68.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1951	5,009	342	606	34,226	-	40,183
1952	11,404	972	632	39,848	-	52,856
1953	13,848	743	463	27,502	-	42,556
1954	7,101	9,777	1,093	38,045	-	56,016
1955	11,448	3,079	3,160	56,463	1,279	75,429
1956	6,006	1,448	616	57,441	866	66,377
1957	5,524	4,139	883	79,122	1,752	91,420
1958	8,391	3,155	2,368	87,245	2,048	103,207
1959	15,298	3,282	5,493	54,299	5,917	84,289
1960	17,778	2,991	2,209	81,416	7,309	111,703
1961	10,206	3,266	3,483	60,953	10,748	88,656
1962	8,816	2,070	2,929	61,283	8,949	84,047
1963	4,713	2,355	3,030	45,979	6,192	62,269
1964	12,902	3,618	3,694	108,606	10,716	139,536
1965	9,793	2,313	4,042	85,910	10,909	112,967
1966	5,456	1,949	1,916	58,184	9,967	77,472
1967	3,705	2,285	1,582	96,240	13,381	117,193
1968	6,398	3,472	2,153	78,201	13,499	103,723
18-Year Total	163,796	51,256	40,352	1,150,963	103,532	1,509,899
18-Year Average	9,100	2,848	2,242	63,942	7,395[1]/	83,883

1/ 14-year average for Togiak district.

(Data Sources: 2, 8 and 12)

APPENDIX TABLE 4. Comparative Bristol Bay chum salmon catch, by district, 1951-68.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1951	38,844	15,439	16,843	85,624	-	156,750
1952	93,835	18,060	19,651	117,875	-	249,421
1953	212,112	26,724	21,027	127,483	-	387,346
1954	138,016	62,040	39,384	159,852	1,352	400,644
1955	39,405	23,238	51,280	97,521	735	212,179
1956	93,841	16,713	6,934	172,546	25,483	315,517
1957	45,620	12,849	13,226	143,461	44,186	259,342
1958	119,324	12,089	12,714	193,688	20,277	358,092
1959	200,458	29,407	20,185	186,891	44,575	481,516
1960	304,286	62,837	51,415	642,099	255,320	1,315,957
1961	182,398	57,429	30,928	267,176	190,001	727,932
1962	176,712	23,053	22,040	290,633	165,107	677,545
1963	100,408	14,807	10,554	167,161	77,167	370,097
1964	153,644	23,496	30,688	463,309	131,371	802,508
1965	45,430	11,188	14,971	177,434	111,521	360,544
1966	57,273	32,085	29,100	129,344	95,410	343,212
1967	49,606	11,039	14,104	338,286	63,322	476,357
1968	43,187	16,193	17,624	178,786	108,001	363,791
18-Year Total	2,094,399	468,686	422,668	3,939,169	1,333,828	8,258,750
18-Year Average	116,356	26,038	23,482	218,843	88,922[1]/	458,819

1/ 15-year average for Togiak district.
(Data Sources: 2, 8 and 12)

APPENDIX TABLE 5. Comparative Bristol Bay pink salmon catch, by district, 1951-68.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1951	11	-	-	23	-	34
1952	6,277	-	1,000	6,852	-	14,129
1953	7	2	-	3	-	12
1954	1,925	-	-	99,207	1,850	102,982
1955	-	-	-	9	-	9
1956	511	4	-	91,457	-	91,972
1957	2	24	-	3	-	29
1958	19,666	492	-	1,113,794	1,590	1,135,542
1959	25	6	78	137	55	301
1960	10,582	-	-	289,781	1,669	302,032
1961	42	3	-	248	245	538
1962	32,436	43	1	880,424	1,030	913,934
1963	56	1	2	226	176	461
1964	49,127	606	18	1,497,817	2,001	1,549,569
1965	514	-	-	95	91	700
1966	142,221	8	11	2,337,066	13,545	2,492,851
1967	20	-	-	265	829	1,114
1968	218,732	111	-	1,705,150	11,743	1,935,736
9-Year Total[1/]	481,477	1,264	1,030	8,021,548	33,428	8,538,747
9-Year Average[1/]	53,497	140	114	891,283	4,179[2/]	948,750

1/ Includes only even years.
2/ 8-year average for Togiak district.
(Data Sources: 2, 8 and 12)

APPENDIX TABLE 6. Comparative Bristol Bay coho salmon catch, by district, 1951-68.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1951	1,404	2,520	35,683	2,856	-	42,463
1952	11	-	2,936	2,067	-	5,014
1953	660	1,761	-	2,195	-	4,616
1954	111	2,932	70	20,423	-	23,536
1955	123	4,208	2,777	13,920	-	21,028
1956	887	8,573	-	53,999	-	63,459
1957	1,619	4,056	-	61,454	1,616	68,745
1958	3,624	4,370	746	127,088	-	135,828
1959	40	1,388	1,397	12,779	1,731	17,335
1960	197	2,421	-	13,457	65	16,140
1961	426	3,533	16	16,653	5	20,633
1962	2,474	3,828	4,553	28,418	11	39,284
1963	6,823	910	2,743	29,648	1,138	41,262
1964	3,133	775	380	26,416	5,859	36,563
1965	3,053	945	713	2,851	521	8,083
1966	4,096	1,932	533	11,517	15,864	33,942
1967	1,175	1,044	1,901	31,517	18,159	53,796
1968	7,357	6,507	5,771	48,867	24,872	93,374
18-Year Total	37,213	51,703	60,219	506,125	69,841	725,101
18-Year Average	2,067	2,872	3,346	28,118	5,820 1/	40,283

1/ 12-year average for Togiak district.
(Data Sources: 2, 8 and 12)

APPENDIX TABLE 7. Comparative Bristol Bay total salmon catch, by district, all species, 1951-68.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
1951	2,971,681	662,852	371,761	559,679	-	4,565,973
1952	9,512,587	905,884	304,365	864,713	-	11,587,549
1953	3,965,466	1,263,830	710,210	606,524	-	6,546,030
1954	1,966,819	1,512,540	1,108,078	632,884	15,482	5,235,803
1955	2,615,317	653,410	298,034	1,222,891	68,099	4,857,751
1956	6,088,995	1,213,837	349,049	1,638,629	128,282	9,418,792
1957	4,631,408	835,527	364,967	775,538	87,598	6,695,038
1958	1,073,616	520,790	449,641	2,613,971	60,317	4,718,335
1959	1,905,246	696,474	450,567	1,973,793	165,480	5,191,560
1960	10,180,691	1,515,133	806,258	2,544,741	404,011	15,450,834
1961	8,360,055	2,750,307	391,650	856,513	393,160	12,751,685
1962	2,501,722	667,856	272,682	2,722,524	268,042	6,432,826
1963	1,069,902	713,655	205,024	1,085,758	270,886	3,345,225
1964	2,462,507	1,132,430	611,548	3,517,089	400,722	8,124,296
1965	19,198,357	3,194,005	945,416	1,059,613	340,142	24,737,533
1966	5,606,584	2,137,148	477,018	3,706,382	334,585	12,261,717
1967	2,391,732	1,085,310	181,331	1,124,019	196,798	4,979,190
1968	1,492,532	697,937	108,005	2,760,285	230,814	5,289,573
18-Year Total	87,995,217	22,158,925	8,405,604	30,265,546	3,364,418	152,189,710
18-Year Average	4,888,623	1,231,051	466,978	1,681,419	224,294[1]/	8,454,984

1/ 15-year average for Togiak district.
(Data Sources: 2, 8 and 12)

APPENDIX TABLE 8. Comparative Bristol Bay catch by species and type of gear, 1951-68.

Year	Type Gear	Catch and Percent by Species											
		Reds	%	Kings	%	Chums	%	Pinks	%	Cohos	%	Total	%
1951	Drift	3,873,309	90	37,874	94	146,280	93	12	35	41,012	97	4,098,487	90
	Set	453,234	10	2,309	6	10,470	7	22	65	1,451	3	467,486	10
	TOTAL	4,326,543		40,183		156,750		34		42,463		4,565,973	
1952	Drift	10,409,579	92	49,636	94	228,042	91	10,902	77	4,411	88	10,702,570	92
	Set	856,550	8	3,220	6	21,379	9	3,227	13	603	12	884,979	8
	TOTAL	11,266,129		52,856		249,421		14,129		5,014		11,587,549	
1953	Drift	5,510,006	90	38,371	90	350,772	91	5	42	2,075	45	5,901,229	90
	Set	601,494	10	4,185	10	36,574	9	7	58	2,541	55	644,801	10
	TOTAL	6,111,500		42,556		387,346		12		4,616		6,546,030	
1954	Drift	4,158,295	89	53,276	95	365,421	91	59,037	57	12,268	58	4,648,297	89
	Set	494,330	11	2,740	5	35,223	9	43,945	43	11,268	42	587,506	11
	TOTAL	4,652,625		56,016		400,644		102,982		23,536		5,235,803	
1955	Drift	4,032,547	89	69,960	93	194,909	92	0	0	12,531	60	4,309,947	89
	Set	516,559	11	5,469	7	17,270	8	9	100	8,497	40	547,804	11
	TOTAL	4,549,106		75,429		212,179		9		21,028		4,857,751	
1956	Drift	8,098,397	91	63,939	96	298,094	94	72,911	79	53,205	84	8,586,546	91
	Set	783,070	9	2,438	4	17,423	6	19,061	21	10,254	16	832,246	9
	TOTAL	8,881,467		66,377		315,517		91,972		63,459		9,418,792	
1957	Drift	5,916,811	94	89,615	98	253,013	98	2	7	63,350	92	6,322,791	94
	Set	358,691	6	1,805	2	6,329	2	27	93	5,395	8	372,247	6
	TOTAL	6,275,502		91,420		259,342		29		68,745		6,695,038	
1958	Drift	2,765,251	93	101,290	98	345,260	96	895,219	79	120,302	89	4,227,322	90
	Set	220,415	7	1,917	2	12,832	4	240,323	21	15,526	11	491,013	10
	TOTAL	2,985,666		103,207		358,092		1,135,542		135,828		4,718,335	
1959	Drift	4,065,995	88	79,644	94	422,086	88	187	62	6,341	37	4,574,253	88
	Set	542,124	12	4,645	6	59,430	12	114	38	10,994	63	617,307	12
	TOTAL	4,608,119		84,289		481,516		301		17,335		5,191,560	

(Continued)

APPENDIX TABLE 8. (Continued)

Year	Type Gear	Catch and Percent by Species											
		Reds	%	Kings	%	Chums	%	Pinks	%	Cohos	%	Total	%
1960	Drift	12,747,132	93	107,138	96	1,178,351	90	200,303	66	5,612	35	14,238,536	92
	Set	957,870	7	4,565	4	137,606	10	101,729	34	10,528	65	1,212,298	8
	TOTAL	13,705,002		111,703		1,315,957		302,032		16,140		15,450,834	
1961	Drift	11,171,226	94	83,800	95	685,833	94	342	64	8,016	39	11,949,217	94
	Set	742,700	6	4,856	5	42,099	6	196	36	12,617	61	802,468	6
	TOTAL	11,913,926		88,656		727,932		538		20,633		12,751,685	
1962	Drift	3,941,097	84	78,486	93	609,396	90	776,392	85	25,424	65	5,430,795	84
	Set	776,919	16	5,561	7	68,149	10	137,542	15	13,860	35	1,002,031	16
	TOTAL	4,718,016		84,047		677,545		913,934		39,284		6,432,826	
1963	Drift	2,470,038	86	57,647	93	315,324	85	243	53	19,495	47	2,862,747	86
	Set	401,098	14	4,622	7	54,773	15	218	47	21,767	53	482,478	14
	TOTAL	2,871,136		62,269		370,097		461		41,262		3,345,225	
1964	Drift	4,802,031	86	131,108	94	694,089	86	1,359,747	88	25,544	70	7,012,519	86
	Set	794,089	14	8,428	6	108,419	14	189,822	12	11,019	30	1,111,777	14
	TOTAL	5,596,120		139,536		802,508		1,549,569		36,563		8,124,296	
1965	Drift	22,366,334	92	106,511	94	317,265	88	613	88	4,514	56	22,795,237	92
	Set	1,888,905	8	6,456	6	43,279	12	87	12	3,569	44	1,942,296	8
	TOTAL	24,255,239		112,967		360,544		700		8,083		24,737,533	
1966	Drift	8,293,143	89	73,602	95	297,942	87	2,223,891	89	25,871	76	10,914,449	89
	Set	1,021,097	11	3,870	5	45,270	13	268,960	11	8,071	24	1,347,268	11
	TOTAL	9,314,240		77,472		343,212		2,492,851		33,942		12,261,717	
1967	Drift	3,870,379	89	113,234	97	454,942	96	827	74	43,763	81	4,483,145	90
	Set	460,351	11	3,959	3	21,415	4	287	26	10,033	19	496,045	10
	TOTAL	4,330,730		117,193		476,357		1,114		53,796		4,979,190	
1968	Drift	2,524,950	90	101,137	98	345,133	95	1,715,761	89	70,808	76	4,757,789	90
	Set	267,899	10	2,586	2	18,658	5	220,075	11	22,566	24	531,784	10
	TOTAL	2,792,849		103,723		363,791		1,935,836		93,374		5,289,573	

(Continued)

APPENDIX TABLE 8. (Continued)

Year	Type Gear	Catch and Percent by Species											
		Reds	%	Kings	%	Chums	%	Pinks	%	Cohos	%	Total	%
Total	Drift	121,016,520		1,436,268		7,502,152		7,314,163		544,542		137,815,876	
1951-68	Set	12,137,395		73,631		756,598		1,224,684		180,559		14,373,834	
	TOTAL	133,153,915		1,509,899		8,258,750		8,538,847[1/]		725,101		152,189,710	
Average	Drift	6,723,140	91	79,793	95	416,786	91	812,685	86	30,252	75	7,656,438	90
1951-68	Set	674,299	9	4,091	5	42,033	9	136,076	14	10,031	25	798,546	10
	TOTAL	7,397,439		83,884		458,819		948,761[2/]		40,283		8,454,984	

1/ Even years only.

2/ 9-year average.

(Data Sources: 2 and 14)

APPENDIX TABLE 9. Comparative Bristol Bay catch of frozen and cured fish, by species and district, 1951-68.[1]/

Year	Catch in Number of Fish					
	Reds	Kings	Chums	Pinks	Cohos	Total
			NAKNEK-KVICHAK DISTRICT			
1951	366,138	244	3,025	-	-	369,407
52	1,378,113	416	10,191	2,020	1	1,390,741
53	219,069	132	3,871	-	-	223,072
54	97,896	277	598	2	-	98,773
55	158,809	730	6,464	-	123	166,126
56	628,642	912	12,779	-	53	642,386
57	655,418	717	7,077	2	-	663,214
58	4,843	324	-	105	345	5,617
59	122	283	-	-	-	405
1960	325,119	242	1,744	8	-	327,113
61	176,435	313	-	-	534	177,282
62	4,430	4,366	281	-	-	9,077
63	14,541	5	2	2	150	14,700
64	15,994	1,159	19	264	193	17,629
65	41,264	825	-	-	17	42,106
66	14,486	260	-	-	-	14,746
67	-	-	-	-	-	-
68	214	103	24	139	197	677
18-Year Total	4,101,533	11,308	46,075	2,538	1,613	4,163,071
18-Year Average	227,863	628	2,560	282[2]/	90	231,282
			EGEGIK DISTRICT			
1951	160,039	53	852	-	2,520	163,464
52	174,770	37	2,962	-	-	177,769
53	375,012	138	12,081	2	1,761	388,994
54	762,970	8,939	44,861	-	2,932	819,702
55	280,174	1,870	9,898	-	4,138	296,080
56	157,880	729	3,139	4	8,573	170,325
57	96,989	3,050	1,824	24	4,056	105,943
58	2,739	1,795	344	365	7,479	12,722
59	9,960	1,761	306	-	5,717	17,744
1960	742	-	-	-	840	1,582
61	181,256	209	3	-	2,385	183,853
62	-	1,520	-	-	820	2,340
63	397	-	-	-	2,394	2,791
64	44,921	1,194	921	12	1,224	48,272
65	3,310	58	15	-	1,836	5,219

(Continued)

APPENDIX TABLE 9. (Continued)

Year	Catch in Numbers of Fish					
	Reds	Kings	Chums	Pinks	Cohos	Total
EGEGIK DISTRICT - (Con't)						
1966	1,155	256	15	-	2,679	4,111
67	1,798	200	-	-	900	2,898
68	1,207	27	57	204	6,579	8,074
18-Year Total	2,255,319	21,836	77,284	585	56,833	2,411,883
18-Year Average	125,296	1,213	4,294	95[2/]	3,157	133,994
UGASHIK DISTRICT						
1951	77,456	40	2,463	-	-	79,959
52	15,000	8	-	1,000	-	16,008
53	99,454	1	2,861	-	-	102,316
54	4,358	-	-	-	-	4,358
55	16,981	16	2,997	-	-	19,994
56	-	-	-	-	-	-
57	-	-	-	-	-	-
58	2,839	766	-	-	730	4,335
59	1,676	1,160	147	-	748	3,731
1960	2,969	937	-	-	-	3,906
61	6,916	960	417	-	-	8,293
62	19,711	35	2,624	-	4,061	26,431
63	12,331	1,433	2,030	-	2,850	18,644
64	30,551	2,350	3,268	-	3,200	39,369
65	41,174	2,558	623	-	-	44,355
66	28,608	740	14,300	3	43	43,694
67	26,704	833	6,956	-	1,010	35,503
68	17,473	1,072	7,670	-	5,841	32,056
18-Year Total	404,201	12,909	46,356	1,003	18,483	482,952
18-Year Average	22,456	717	2,575	111[2/]	1,027	26,831
NUSHAGAK DISTRICT						
1951	29,162	22,874	5,093	3	2,779	59,911
52	310	11	-	-	-	321
53	21,587	1,212	2,013	1	2,031	26,844
54	3,086	8,903	310	58	1,414	13,771
55	65,001	19,533	6,085	-	214	90,833
56	223,787	24,410	21,895	9,179	1,796	281,067
57	12,991	25,421	5,163	-	1,982	45,557
58	1,059	4,352	-	-	405	5,816

(Continued)

APPENDIX TABLE 9. (Continued)

Year	Catch in Numbers of Fish					
	Reds	Kings	Chums	Pinks	Cohos	Total
			NUSHAGAK DISTRICT - (Con't)			
1959	679	4,604	121	-	2,449	7,853
1960	960	2,537	103	-	-	3,600
61	1,410	9,941	378	-	577	12,306
62	1,386	3,282	48	-	4,259	8,975
63	10,482	8,733	10,896	1	462	30,574
64	-	390	-	-	-	390
65	-	-	-	-	-	-
66	42	613	315	-	876	1,846
67	5,307	19,653	3,590	-	4,834	33,384
68	32,250	16,761	2,406	127	10,381	61,925
18-Year Total	409,499	173,230	58,416	9,364	34,459	684,973
18-Year Average	22,750	9,624	3,245	1,040[2]/	1,914	38,054
			TOGIAK DISTRICT			
1954	4,926	-	675	807	-	6,408
55	-	-	-	-	-	-
56	-	-	-	-	-	-
57	165	-	-	-	1,616	1,781
58	-	-	-	-	-	-
59	-	-	-	-	-	-
1960	19,505	3,443	30,052	-	-	53,000
61	9,986	63	4,529	6	-	14,584
62	3,518	624	3,646	3	-	7,791
63	-	-	-	-	-	-
64	1,880	3,931	-	-	4,339	10,150
65	-	-	-	-	-	-
66	58	4	36	1	12,483	12,582
67	29	-	27	-	17,786	17,842
68	5,822	4,724	10,042	-	25,574	46,162
15-Year Total	45,889	12,789	49,007	811[3]/	61,798	170,300
15-Year Average	3,059	853	3,267	101[3]/	4,120	11,353

(Continued)

APPENDIX TABLE 9. (Continued)

Year	Catch in Numbers of Fish					
	Reds	Kings	Chums	Pinks	Cohos	Total
		TOTAL BRISTOL BAY				
1951	632,795	23,211	11,433	3	5,299	672,741
52	1,568,193	472	13,153	3,020	1	1,584,839
53	715,122	1,483	20,826	3	3,792	741,226
54	873,236	18,119	46,444	867	4,346	943,012
55	520,965	22,149	25,444	-	4,475	573,033
56	1,010,309	26,051	37,813	9,183	10,422	1,093,778
57	765,563	29,188	14,064	26	7,654	816,495
58	11,480	7,237	344	470	8,959	28,490
59	12,437	7,808	574	-	8,914	29,733
1960	349,295	7,159	31,899	8	840	389,201
61	376,003	11,486	5,327	6	3,496	396,318
62	29,045	9,827	6,599	3	9,140	54,614
63	37,751	10,171	12,928	3	5,856	66,709
64	93,346	9,024	4,208	276	8,956	115,810
65	85,748	3,441	638	-	1,853	91,680
66	44,349	1,873	14,672	4	16,081	76,979
67	33,838	20,686	10,573	-	24,530	89,627
68	56,966	22,687	20,199	470	48,572	148,894
18-Year Total	7,216,441	232,072	277,137	14,301	173,186	7,913,179
18-Year Average	400,913	12,893	15,397	1,590[2/]	9,621	439,621

1/ Includes fresh, frozen, salted and mild-cured fish.

2/ 9-year average.

3/ 8-year average.

(Data Sources: 1 and 14)

APPENDIX TABLE 10. Comparative Bristol Bay case pack by species, 1951-68.

Year	48 1-lb. Cans Per Case					
	Reds	Kings	Chums	Pinks	Cohos	Total
1951	309,936	4,661	15,744	0	4,366	334,707
1952	715,083	11,380	31,457	1,339	793	760,052
1953	445,535	8,050	37,052	3	333	490,973
1954	308,405	9,266	32,232	4,732	2,839	357,474
1955	312,284	13,089	20,701	0	1,928	348,002
1956	529,726	9,386	24,450	3,918	4,133	571,613
1957	471,979	16,285	23,940	0	4,220	516,424
1958	241,099	24,844	34,954	61,740	10,555	373,192
1959	332,713	17,364	42,812	0	2,582	395,471
1960	854,807	19,566	103,569	12,055	3,073	993,070
1961	926,441	15,501	51,828	0	1,980	995,750
1962	361,226	16,797	58,571	38,638	2,941	478,173
1963	217,901	9,495	34,157	2	4,296	265,851
1964	372,928	25,677	70,523	67,431	5,024	541,583
1965	1,447,771	24,248	31,826	0	338	1,504,183
1966	737,948	14,850	28,814	95,071	2,345	879,028
1967	334,177	19,499	45,321	8	3,100	402,105
1968[1/]	214,400	18,792	33,902	73,087	4,321	344,502
18-Year Total	9,134,359	278,750	721,853	358,024	59,167	10,552,153
18-Year Average	507,464	15,486	40,103	39,780	3,287	586,231

1/ Preliminary.
2/ Average pink case pack includes even years only; 9-year average.
(Data Sources: 1, 3, 8 and 13)

APPENDIX TABLE 11. Comparative Bristol Bay fish per case, by species, 1951-68.*

Year	Reds	Kings	Chums	Pinks	Cohos
1951	11.87	4.53	10.87	18.16	10.29
1952	13.69	5.12	10.34	13.37	10.57
1953	11.91	5.22	10.16	23.09	10.30
1954	12.04	4.79	10.26	18.47	10.69
1955	12.77	4.13	9.84	-	11.17
1956	12.91	4.15	11.50	20.93	12.64
1957	11.79	3.81	10.21	-	-
1958	12.30	4.20	9.40	18.20	12.80
1959	12.80	4.10	11.40	23.00	7.80
1960	14.58	6.19	12.58	17.27	11.34
1961	11.93	4.43	11.25	19.19	7.39
1962	12.45	4.66	11.47	25.80	12.10
1963	12.15	5.49	11.36	-	12.21
1964	13.57	5.31	11.01	25.58	12.58
1965	15.75	4.28	12.31	-	9.08
1966	12.62	5.22	11.91	26.22	14.47
1967	12.96	6.01	10.51	13.93	17.35
1968[1/]	12.76	4.32	13.50	26.48	10.76
18-Year Total	23,085	8,596	19,988	19,232	19,354
18-Year Average	12.83	4.78	11.10	21.37[2/]	11.38[3/]

1/ Preliminary.
2/ Average fish per case includes even years only; 9-year average.
3/ 17-year average.
* Mesh size changed to 5-3/8 inches in 1962, previously 5-1/2 inches.
(Data Sources: 1 and 3)

APPENDIX TABLE 12. Comparative wholesale value of Bristol Bay case pack by species, 1951-68.

Year	Kings	Reds	Chums	Pinks	Cohos	Total
1951	$ 121,200	$ 9,453,000	$ 283,400	$ -	$ 109,200	$ 9,966,800
1952	284,500	20,379,900	503,300	25,400	17,100	21,210,200
1953	193,200	12,029,400	518,700	100	6,700	12,748,100
1954	231,700	8,789,500	483,500	94,600	65,300	9,664,600
1955	366,500	10,149,200	372,600	-	50,100	10,938,400
1956	276,900	17,745,800	513,500	92,100	117,800	18,746,100
1957	464,100	15,811,300	478,800	-	116,100	16,870,300
1958	708,100	8,197,400	594,200	1,296,500	290,300	11,086,500
1959	512,200	12,144,000	899,100	-	78,800	13,634,100
1960	616,300	31,200,500	2,330,300	295,300	95,300	34,537,700
1961	561,200	34,929,100	1,473,700	15,100	75,400	37,054,500
1962	523,700	12,402,500	1,521,300	1,023,000	105,700	15,576,200
1963	290,600	8,994,000	762,300	-	152,100	10,199,000
1964	794,500	11,060,500	1,415,200	1,694,500	116,400	15,081,100
1965	739,800	54,092,900	717,100	-	11,200	55,561,000
1966	453,000	27,079,400	721,400	2,662,000	69,000	30,984,800
1967	713,200	14,858,600	1,283,500	300	126,800	16,982,400
1968[1/]	635,100	8,542,900	914,900	2,229,200	144,800	12,466,900
18-Year Total	$8,485,800	$317,859,900	$15,786,800	$9,428,100	$1,748,100	$353,308,700
18-Year Average	$ 471,400	$ 17,658,900	$ 877,000	$1,047,600[2/]	$ 97,100	$ 19,628,800

1/ Preliminary.
2/ Includes even years only; 9-year average.
(Data Sources: 1, 3, 10, 13 and 15)

APPENDIX TABLE 13. Comparative Bristol Bay fish prices by species, 1960-68.[1/]

Species	Price Per Fish							
	1960	1961	1962	1963	1964-65	1966	1967	1968
Independent Fishermen								
Reds	.95	1.00	1.04	1.08	1.09	1.13	1.18	1.19
Kings, Large	3.50	3.68	3.75	3.75	3.75	3.87	3.87	3.87
Med.	1.75	1.84	1.87	1.87	1.87	1.94	1.94	1.94
Small	-	1.00	1.00	1.00	1.00	1.00	1.03	1.03
Chums	.51	.54	.56	.58	.58	.60	.60	.60
Pinks	.29	.30	.31	.32	.32	.33	.33	.33
Cohos	.95	1.00	1.04	1.08	1.09	1.13	1.18	1.19
Company Fishermen								
Reds	.58	.62	.64	.67	.67	.70	.73	.74
Kings, Large	2.53	2.66	2.70	2.70	2.70	2.40	2.78	2.78
Med.	2 for 1	2 for 1	2 for 1	2 for 1	2 for 1	1.20	1.39	1.39
Small						.64	.69	.69
Chums	.33	.34	.36	.37	.37	.37	.37	.37
Pinks	.16	-	-	-	-	.20	.17	.17
Cohos	.58	.62	.64	.67	.67	.70	.73	.74

1/ Prices rounded to nearest hundred.

(Data Source: 1)

APPENDIX TABLE 14. Comparative Bristol Bay red salmon escapements by district, 1951-68.

Year	Naknek-Kvichak[1/]	Egegik	Ugashik[3/]	Nushagak	Togiak[4/]	Total
1951	-	950,000[2/]	205,881	539,600	51,000	-
1952	6,073,178	756,921	651,209	433,800	102,000	8,017,108
1953	603,148	519,098	1,056,361	828,542	102,000	3,109,149
1954	1,040,167	507,298	458,635	691,624	77,000	2,774,724
1955	700,546	271,039	76,982	1,933,755	112,000	3,094,322
1956	11,999,913	1,104,268	425,295	1,212,101	225,000	14,966,577
1957	3,604,050	391,207	214,802	498,727	25,000	4,733,786
1958	907,553	246,354	279,546	1,277,933	72,000	2,783,386
1959	3,737,238	1,072,459	219,228	3,041,885	209,640	8,280,450
1960	16,698,911	1,798,764	2,341,400	1,673,258	192,010	22,704,343
1961	4,146,963	701,538	366,439	859,633	127,454	6,202,027
1962	3,394,580	1,027,482	274,026	937,698	71,552	5,705,338
1963	1,447,422	997,602	397,004	1,063,856	127,596	4,033,480
1964	2,555,424	849,576	482,770	1,339,004	114,674	5,341,448
1965	25,218,744	1,444,608	997,862	1,099,266	112,786	28,873,266
1966	4,965,965	804,246	714,836	1,630,726	122,998	8,238,771
1967	4,174,474	636,864	243,930	875,452	91,330	6,022,050
1968	3,774,534	338,654	70,896	976,664	56,418	5,217,166
18-Year Total	95,042,810	14,417,978	9,477,102	20,913,524	1,992,458	140,097,391
18-Year Average	5,280,156[5/]	800,999	526,506	1,161,862	110,692	8,241,023[5/]

1/ 1952-1954 aerial surveys: Naknek and Kvichak rivers only; Branch River included from 1955 on.
2/ Aerial survey estimate.
3/ Includes Mother Goose system beginning in 1960 through 1967.
4/ 1951-1953 and 1956-1958 includes Togiak Lakes only. 1954-1955 includes only Ongivinuk system and 1959 to date includes all Togiak tributaries. Kulukak system included 1961 to date.
5/ 17-year average.

(Data Source: 1, 5, 6, 7, 11 and 14)

APPENDIX TABLE 15. Comparative catch and escapement of red salmon in the Naknek-Kvichak district by river system, 1955-68.

Year	Escapement by River System				Catch	Total Run
	Kvichak[1/]	Branch[2/]	Naknek[3/]	Total		
1955	250,546	171,500	278,500	700,546	2,564,341	3,264,887
1956	9,443,318	784,000	1,772,595	11,999,913	5,987,750	17,987,663
1957	2,842,810	126,595	634,655	3,604,060	4,578,643	8,182,693
1958	534,785	94,650	278,118	907,553	922,611	1,830,164
1959	680,000	825,431	2,231,807	3,737,238	1,689,425	5,426,663
1960	14,630,000	1,240,530	828,381	16,698,911	9,847,848	26,546,759
1961	3,705,849	90,036	351,078	4,146,963	8,166,983	12,313,946
1962	2,580,884	90,630	723,066	3,394,580	2,281,284	5,675,864
1963	338,760	203,304	905,358	1,447,422	957,902	2,405,324
1964	957,120	248,700	1,349,604	2,555,424	2,243,701	4,799,125
1965	24,325,926	175,020	717,798	25,218,744	19,139,567	44,358,311
1966	3,775,184	174,336	1,016,445	4,965,965	5,397,538	10,363,503
1967	3,216,208	202,626	755,640	4,174,474	2,337,226	6,511,700
1968	2,557,440	193,872	1,023,222	3,774,534	1,216,858	4,991,392
14-Year Total	69,838,830	4,621,230	12,866,267	87,326,327	67,331,677	154,658,004
14-Year Average	4,988,487	330,088	919,019	6,237,595	4,809,406	11,047,000

1/ Tower counts 1955-68.
2/ Aerial survey estimate 1955-56; tower count 1957-68.
3/ Weir count 1955-56; tower count 1957-68.
(Data Sources: 1, 2, 5, 8, 11, 12 and 14)

APPENDIX TABLE 16. Comparative catch and escapement by river system, Egegik and Ugashik districts, red salmon, 1951-68.

Year	Egegik District			Ugashik District				
	Escapement	Catch	Total Run	Escapement			Catch	Total Run
	Egegik[1/]			Ugashik[2/]	Mother Goose[3/]	Total		
1951	950,000	644,551	1,594,551	205,881	-	205,881	318,629	524,510
1952	756,921	886,852	1,643,773	651,209	-	651,209	280,146	931,355
1953	519,098	1,234,600	1,753,698	1,056,361	-	1,056,361	688,720	1,745,081
1954	507,298	1,437,791	1,945,089	458,635	-	458,635	1,067,531	1,526,166
1955	271,039	622,885	893,924	76,982	-	76,982	240,817	317,799
1956	1,104,268	1,187,099	2,291,367	425,295	-	425,295	341,499	766,794
1957	391,207	814,459	1,205,666	214,802	-	214,802	350,858	565,660
1958	246,354	500,684	747,038	279,546	-	279,546	433,813	713,359
1959	1,072,459	662,391	1,734,850	219,228	-	219,228	423,414	642,642
1960	1,798,764	1,446,884	3,245,648	2,304,200	37,200	2,341,400	752,634	3,094,034
1961	701,538	2,686,076	3,387,614	348,639	17,800	366,439	357,223	723,662
1962	1,027,482	638,862	1,666,344	255,426	18,600	274,026	243,159	517,185
1963	997,602	695,582	1,693,184	388,254	8,750	397,004	188,695	585,699
1964	849,576	1,103,935	1,953,511	472,770	10,000	482,770	576,768	1,059,538
1965	1,444,608	3,179,559	4,624,167	996,612	1,250	997,862	925,690	1,923,552
1966	804,246	2,101,174	2,905,420	704,436	10,400	714,836	445,458	1,160,294
1967	636,864	1,070,942	1,707,806	238,830	5,100	243,930	163,744	407,674
1968	338,654	671,554	1,010,208	70,896	-	70,896	82,457	153,353
18-Year Total	14,417,978	21,585,880	36,003,858	9,368,002	109,100	9,477,102	7,881,255	17,358,357
18-Year Average	800,999	1,199,216	2,000,214	520,445	13,638	526,506	437,848	964,353

1/ Aerial survey estimate 1951; weir count 1952-56; tower count 1957-68.
2/ Weir count 1951-56; tower count 1957-68.
3/ Aerial survey estimate 1960-67.
(Data Sources: 1, 2, 7, 8, 11, 12 and 14)

APPENDIX TABLE 17. Comparative catch and escapement of red salmon, in the Nushagak district by river system, 1951-68.

Year	Escapement by River System						Catch	Total Run
	Wood[1/]	Igushik[2/]	Snake[3/]	Nuyakuk[4/]	Nushagak-Mulchatna[5/]	Total		
1951	457,600	40,000	3,000	39,000	-	539,600	436,950	976,550
1952	226,800	150,000	4,000	38,000	15,000	433,800	698,071	1,131,871
1953	515,542	100,000	4,000	189,000	20,000	828,542	449,341	1,277,883
1954	570,624	80,000	4,000	29,000	8,000	691,624	315,357	1,006,981
1955	1,382,755	500,000	30,000	16,000	5,000	1,933,755	1,054,978	2,988,733
1956	773,101	400,000	4,000	30,000	5,000	1,212,101	1,263,186	2,475,287
1957	288,727	130,000	3,000	67,000	10,000	498,727	491,498	990,225
1958	960,455	107,478	9,000	196,000	5,000	1,277,933	1,092,156	2,370,089
1959	2,209,266	643,808	139,950	48,861	-	3,041,885	1,719,687	4,761,572
1960	1,016,073	495,087	16,598	145,500	-	1,673,258	1,517,988	3,191,246
1961	460,737	294,252	4,856	79,788	20,000	859,633	511,483	1,371,116
1962	873,888	15,660	1,760	37,890	8,500	937,698	1,461,766	2,399,464
1963	721,404	92,184	37,960	166,608	45,700	1,063,856	842,744	1,906,600
1964	1,076,112	128,532	12,436	103,224	18,700	1,339,004	1,420,941	2,759,945
1965	675,156	180,840	12,000	203,070	28,200	1,099,266	793,323	1,892,589
1966	1,208,682	206,360	4,500	161,010	50,174	1,630,726	1,170,271	2,800,997
1967	515,772	281,772	11,000	20,250	46,658	875,452	657,711	1,533,163
1968	649,344	194,508	4,100	96,642	32,070	976,664	749,281	1,725,945
18-Year Total	14,582,038	4,040,481	306,160	1,666,843	318,002	20,913,524	16,646,732	37,560,256
18-Year Average	810,113	224,471	17,009	92,602	21,200[6/]	1,161,862	924,818	2,086,681

1/ Aerial survey estimate 1951-52; tower count 1953-68.
2/ " " " 1951-57; tower count 1958-68.
3/ " " " 1951-59 and 1965-68; tower count 1960-64.
4/ " " " 1951-58; tower count 1959-68.
5/ " " " 1952-58 and 1961-65; tower count 1966-68.
6 15-year average.
(Data Sources: 1, 2, 5, 6, 8, 12 and 14)

APPENDIX TABLE 18. Comparative catch and escapement of red salmon in the Togiak district by river system, 1951-68.

Year	Escapement by River System				Catch	Total Run
	Togiak[1/]	Tributaries[2/]	Kulukak[3/]	Total		
1951	51,000	-	-	51,000	-	51,000
1952	102,000	-	-	102,000	-	102,000
1953	102,000	-	-	102,000	-	102,000
1954	57,000	20,000	-	77,000	12,280	89,280
1955	104,000	8,000	-	112,000	66,085	178,085
1956	225,000	-	-	225,000	101,933	326,933
1957	25,000	-	-	25,000	40,044	65,044
1958	72,000	-	-	72,000	36,402	108,402
1959	178,740	30,900	-	209,640	113,202	322,842
1960	162,810	29,200	-	192,010	139,648	331,658
1961	95,454	26,800	5,200	127,454	192,161	319,615
1962	47,352	14,600	9,600	71,552	92,945	164,497
1963	102,396	13,800	11,400	127,596	186,213	313,809
1964	95,574	9,300	9,800	114,674	250,775	365,449
1965	88,386	8,100	16,300	112,786	217,100	329,886
1966	91,098	13,100	18,800	122,998	199,799	322,797
1967	69,330	12,000	10,000	91,330	101,107	192,437
1968	42,918	7,000	6,500	56,418	72,699	129,117
Total	1,712,058	192,800	87,600	1,992,458	1,822,393	3,814,851
Average	95,114	16,067	10,950	110,692	121,493	211,936

1/ Aerial survey estimate 1951-59; tower count 1960-68.
2/ " " " 1954-55 and 1959-68.
3/ " " " 1961-68.
(Data Sources: 1, 2, 5, 8, 12 and 14)

APPENDIX TABLE 19. Comparative total inshore return of Bristol Bay red salmon, by district, 1951-68.

Year	Catch and Escapement by District					Total Run Bristol Bay
	Naknek-Kvichak[1/]	Egegik	Ugashik	Nushagak	Togiak	
1951	-	1,594,551	524,510	976,550	51,000	-
1952	15,474,238	1,643,773	931,355	1,131,871	102,000	-
1953	4,341,987	1,753,698	1,745,081	1,277,883	102,000	-
1954	2,859,833	1,945,089	1,526,166	1,006,981	89,280	-
1955	3,264,887	893,924	317,799	2,988,733	178,085	7,643,428
1956	17,987,663	2,291,367	766,794	2,475,287	326,933	23,848,044
1957	8,182,693	1,205,666	565,660	990,225	65,044	11,009,288
1958	1,830,164	747,038	713,359	2,370,089	108,402	5,769,052
1959	5,426,663	1,734,850	642,642	4,761,572	322,842	12,888,569
1960	26,546,759	3,245,648	3,094,034	3,191,246	331,658	36,409,345
1961	12,313,946	3,387,614	723,662	1,371,116	319,615	18,115,983
1962	5,675,864	1,666,344	517,185	2,399,464	164,497	10,423,354
1963	2,405,324	1,693,184	585,699	1,906,600	313,809	6,904,662
1964	4,799,125	1,953,511	1,059,538	2,759,945	365,449	10,937,568
1965	44,358,311	4,624,167	1,923,552	1,892,589	329,886	53,128,505
1966	10,363,503	2,905,420	1,160,294	2,800,997	322,797	17,553,011
1967	6,511,700	1,707,806	407,674	1,533,163	192,437	10,352,780
1968	4,991,392	1,010,208	153,353	1,725,945	129,117	8,010,015
18-Year Total	177,334,052	36,003,858	17,358,357	37,560,256	3,814,851	232,993,604
18-Year Average	10,431,415[2/]	2,000,214	964,353	2,086,681	211,936	16,642,400[3/]

1/ 1952-54 Branch River escapement not included.
2/ 17-year average.
3/ 14-year average.
(Data Sources: 1, 2, 5, 6, 7, 8, 11, 12 and 14)

APPENDIX TABLE 20. Comparative inshore and high seas catches and total Bristol Bay red salmon runs, 1955-68. (In Millions)

Year	Bristol Bay Catch	Japanese Catch of Bristol Bay Red Salmon[1]	Total Catch	Bristol Bay Escapement	Bristol Bay Total Run[4]	% Japanese Catch of Total Catch	% Japanese Catch of Total Bristol Bay Run
1955	4.549	1.869[2]	6.418	3,094	9.512	29.1	19.6
1956	8.881	2.812	11.693	14.967	26.660	24.0	10.5
1957	6.276	9.736	16.012	4.734	20.746	60.8	46.9
1958	2.986	1.356	4.342	2.783	7.125	31.2	19.0
1959	4.608	1.221	5.829	8.280	14.109	20.9	8.7
1960	13.705	5.193	18.898	22.704	41.602	27.5	12.5
1961	11.914	7.389	19.303	6.202	25.505	38.3	29.0
1962	4.718	1.375	6.093	5.705	11.798	22.6	11.7
1963	2.871	1.287	4.158	4.033	8.191	31.0	15.7
1964	5.596	1.447	7.043	5.341	12.384	20.5	11.7
1965	24.255	8.001	32.256	28.873	61.129	24.8	13.1
1966	9.314	2.787	12.101	8.239	20.340	23.0	13.7
1967	4.331	1.700	6.031	6.022	12.053	28.2	14.1
1968	2.793	1.527[3]	4.320	5.217	9.537	35.3	16.0
14-Year Total	106.797	47.700	154.497	126.194	280,697		
14-Year Average	7.628	3.407	11.036	9.014	20.049	30.9	17.0

1/ Includes immature red salmon caught in previous year.
2/ Includes only mature salmon caught in 1955.
3/ Preliminary.
4/ Includes Bristol Bay catch and escapement and Japanese catch.
(Data Sources: 1, 2, 8, 11 and 12)

APPENDIX TABLE 21. Comparative Japanese high seas catches of red salmon of Bristol Bay origin, 1952-1968 (in thousands of fish).

Year	Matures[1/]	Immatures[2/]	Total
1952	367	34	401
1953	406	0	406
1954	600	0	600
1955	1,869	60	1,929
1956	2,752	2,076	4,828
1957	7,660	342	8,002
1958	1,014	151	1,165
1959	1,070	1,185	2,255
1960	4,008	968	4,976
1961	6,421	62	6,483
1962	1,313	271	1,584
1963	1,016	829	1,845
1964	618	1,836	2,454
1965	6,165	739	6,904
1966	2,048	737	2,785
1967	963	606	1,569
1968[3/]	921	880	1,801

1/ Includes the May and June 1-10 catches east of 170° E, the June 11-20 catches east of 175° E, and the June 21-30 catches east of 180°.

2/ Includes red salmon taken on high seas at times and in areas where immature Bristol Bay reds are in large majority. These are mostly .2 age fish that otherwise would be expected to mature and return to Bristol Bay as .3's. Includes July and August catches east of 170°, and June 21-30 catches between 175° E and 180°.

3/ Preliminary.

(Data Source: 11)

APPENDIX TABLE 22. Comparison of average round weight of red, king, chum, pink and coho salmon in the commercial catch, by district, Bristol Bay, 1963-68.[1/]

NAKNEK-KVICHAK DISTRICT

Red Salmon	No. Sampled	Average Weight
1963	284	6.2
1964	1,318	5.2
1965	564	4.6
1966	129	6.3
1967	542	5.9
1968	414	5.8

EGEGIK DISTRICT

Red Salmon	No. Sampled	Average Weight
1963	204	6.4
1964	524	5.9
1965	417	5.2
1966	293	6.4
1967	187	6.3
1968	277	6.1

UGASHIK DISTRICT

Red Salmon	No. Sampled	Average Weight
1963	105	6.2
1964	438	5.3
1965	315	5.3
1966	98	6.5
1967	237	6.3
1968	292	5.9

NUSHAGAK DISTRICT

Red Salmon	No. Sampled	Average Weight
1963	128	6.1
1964	5,051	6.2
1966	359	6.3
1967	376	5.9
1968	467	6.5
King Salmon		
1964	258	14.7
1965	347	20.1
1966	796	18.3
1967	971	21.0
1968	558	22.2

(Continued)

APPENDIX TABLE 22. (Continued)

Chum Salmon	No. Sampled	Average Weight
1965	74	6.1
1966	44	8.6
1967	447	6.6
1968	462	6.9
Pink Salmon		
1964	225	3.2
1966	299	3.1
1968	644	3.2
Coho Salmon		
1964	39	6.8
1966	399	7.5
1967	473	7.0
1968	129	7.6

TOGIAK DISTRICT

Red Salmon	No. Sampled	Average Weight
1964	2,148	6.5
1965	1,394	6.0
1966	1,146	6.9
1967	266	7.0
1968	626	7.0
King Salmon		
1964	39	15.9
1965	257	21.8
1966	147	20.7
1967	32	21.3
1968	212	25.4
Chum Salmon		
1964	14	7.0
1965	188	6.8
1966	442	7.5
1967	265	7.0
1968	303	7.4

1/ Unweighted arithmetic averages except for red salmon data which was weighted by age composition of the catch.

(Data Sources: 1 and 5)

APPENDIX TABLE 23. Sex composition of Bristol Bay red salmon run, 1963-68.[1/]

Year	1963		1964		1965	
	Percent		Percent		Percent	
DISTRICT	Male	Female	Male	Female	Male	Female
NAKNEK-KVICHAK						
Kvichak R. Escapement	52.07	47.93	58.26	41.74	42.91	57.08
Branch R. Escapement	40.16	59.84	38.21	61.79	49.17	50.83
Naknek R. Escapement	45.46	54.54	41.66	58.34	48.44	51.56
Naknek-Kvichak Catch	47.97	52.03	53.85	46.15	61.36	38.64
System Total	46.94	53.06	50.49	49.51	50.99	49.01
EGEGIK						
Egegik R. Escapement	49.22	50.78	46.16	53.84	30.06	69.94
Egegik Catch	47.10	52.90	51.18	48.82	58.80	41.20
System Total	48.35	51.65	49.00	51.00	49.82	50.18
UGASHIK						
Ugashik R. Escapement	43.60	56.40	44.53	55.47	33.73	66.27
Ugashik Catch	51.80	48.20	59.73	40.27	60.32	39.68
System Total	46.26	53.74	52.88	47.12	46.54	53.46
NUSHAGAK						
Wood R. Escapement	42.60	57.40	38.69	61.31	38.35	61.65
Igushik R. Escapement	44.90	55.10	35.91	64.09	36.53	63.47
Nuyakuk R. Escapement	47.10	50.80	45.39	54.61	41.10	58.90
Snake R. Escapement	49.20	52.90	53.49	46.51	-	-
Nushagak Catch	41.96	58.04	49.90	50.10	41.96	58.04
Igushik Catch	-	-	47.90	52.10	39.73	60.27
System Total	42.98	57.02	44.69	55.31	39.94	60.06
TOGIAK						
Togiak R. Escapement	53.76	46.24	52.53	47.47	46.22	53.78
Togiak Catch	42.62	57.38	49.09	50.91	36.40	63.60
System Total	46.57	53.43	50.04	49.96	39.24	60.76
BRISTOL BAY						
Escapement	46.31	53.69	45.03	54.97	41.97	58.03
Catch	45.90	54.10	52.71	47.29	60.12	39.88
Total	46.14	53.86	48.98	51.02	50.27	49.73

APPENDIX TABLE 23. (Continued)

Year	1966		1967		1968[2/]	
	Percent		Percent		Percent	
DISTRICT	Male	Female	Male	Female	Male	Female
NAKNEK-KVICHAK						
Kvichak R. Escapement	42.32	57.68	53.35	46.65	51.96	48.04
Branch R. Escapement	43.00	57.00	47.66	52.34	44.90	55.10
Naknek R. Escapement	44.26	55.74	47.66	52.34	55.20	44.80
Naknek-Kvichak Catch	35.94	64.06	47.23	52.77	48.44	51.56
System Total	39.20	60.80	48.90	51.10	51.49	48.51
EGEGIK						
Egegik R. Escapement	46.35	53.65	46.94	53.06	45.81	54.19
Egegik Catch	32.88	67.12	42.62	57.38	44.80	55.20
System Total	36.61	63.39	41.87	58.13	45.14	54.86
UGASHIK						
Ugashik R. Escapement	38.03	61.97	42.96	57.04	46.72	53.28
Ugashik Catch	38.31	61.69	44.37	55.63	51.29	48.71
System Total	38.14	61.86	43.53	56.47	49.18	50.82
NUSHAGAK						
Wood R. Escapement	39.96	60.04	41.41	58.59	47.07	52.93
Igushik R. Escapement	47.60	52.40	46.28	53.72	49.37	50.63
Nuyakuk R. Escapement	38.35	61.65	40.11	59.89	45.94	54.06
Nushagak Catch	55.89	44.11	43.87	56.13	49.30	50.70
Igushik Catch	47.25	52.75	40.78	59.22	-	-
System Total	55.50	44.50	43.44	56.56	48.38	51.62
TOGIAK						
Togiak R. Escapement	37.50	62.50	43.96	56.04	55.63	44.37
Togiak Catch	31.28	68.72	35.69	64.31	37.33	62.67
System Total	33.23	66.77	38.50	61.50	44.12	55.88
BRISTOL BAY						
Escapement	42.26	57.74	48.64	51.36	51.09	48.91
Catch	37.72	62.28	43.73	56.27	47.59	52.41
Total	39.84	60.16	46.57	53.43	49.87	50.13

1/ Minor river system escapements in the Ugashik, Nushagak and Togiak districts were included in some years and not in others depending on adequacy of the escapement information.

2/ Preliminary.

(Data Source: 4)

APPENDIX TABLE 24. Comparative sex composition of pink salmon catch and escapement in the Nushagak district, 1960-68.[1/]

Year	No. of Samples	No. in Sample		Percent		No. of Fish		Total
		Males	Females	Males	Females	Males	Females	
				CATCH				
1960	6	514	127	80.2	19.8	232,404	57,377	289,781
1962	1	151	160	48.6	51.4	427,886	452,538	880,424
1964	19	560	255	68.7	31.3	1,029,000	468,817	1,497,817
1966	38	589	430	54.6	45.4	1,275,629	1,275,629	2,337,066
1968	19	846	215	82.9	17.1	1,413,534	291,616	1,705,150
				ESCAPEMENT[2/]				
1960	-	-	-	32.4[3/]	67.6[3/]	47,434	98,966	146,400
1962	2	13	36	26.5	73.5	143,895	399,105	543,000
1964	52	717	1,180	37.8	62.2	344,184	566,356	910,540
1966	41	463	741	36.7	63.3	529,221	913,203	1,442,424
1968	4	288	797	28.6	71.4	617,771	1,543,345	2,161,116
				SYSTEM TOTAL				
1960	6	514	127	64.2	35.8	279,838	156,343	436,181
1962	3	164	196	40.2	59.8	571,781	851,643	1,423,424
1964	71	1,277	1,435	57.0	43.0	1,373,184	1,035,173	2,408,357
1966	79	1,052	1,171	47.8	52.2	1,804,850	1,974,640	3,779,490
1968	23	1,134	1,012	52.5	47.5	2,031,305	1,834,961	3,866,266

1/ Even years only.

2/ Sex ratio derived from sampling of Nuyakuk River escapement.

3/ Sex composition interpolated for 1960 escapement by taking geometric mean of 1962 and 1964 ratios.

(Data Source: 1)

APPENDIX TABLE 25. Age composition of red salmon catch and escapement combined, Naknek-Kvichak district, 1963-68.

Age Class		Percent by Year and Age Class					
		1963	1964	1965	1966	1967	1968
3_1	0.2	-	0.02	-	-	-	-
3_2	1.1	0.07	0.22	0.04	-	0.22	0.68
4_1	0.3	-	0.03	+	-	0.01	-
4_2	1.2	30.96	56.30	1.32	2.66	5.32	47.09
4_3	2.1	0.31	2.91	0.01	0.06	0.18	2.46
5_2	1.3	10.01	14.24	2.32	9.37	6.45	9.76
5_3	2.2	25.13	21.32	94.96	22.51	69.60	25.53
6_2	1.4	0.09	0.01	-	-	0.04	0.03
6_3	2.3	33.23	4.78	1.34	65.29	17.99	13.87
6_4	3.2	0.17	0.07	+	0.09	0.07	0.44
7_3	2.4	0.01	-	-	-	0.01	-
7_4	3.3	0.02	0.10	0.01	0.02	0.11	0.14
Total Percent		100.00	100.00	100.00	100.00	100.00	100.00

(Data Source: 4)

APPENDIX TABLE 26. Age composition of red salmon catch and escapement combined, Egegik district, 1963-68.

Age Class		Percent by Year and Age Class					
		1963	1964	1965	1966	1967	1968
3_2	1.1	-	0.02	-	-	0.03	+
4_1	0.3	-	-	0.05	-	0.03	-
4_2	1.2	3.74	21.89	1.57	0.68	0.82	10.53
4_3	2.1	0.09	1.06	-	0.01	0.10	0.54
5_2	1.3	3.67	7.81	5.33	6.85	3.60	9.34
5_3	2.2	41.67	50.75	85.14	13.68	50.15	45.08
5_4	3.1	0.40	0.02	-	-	-	0.09
6_2	1.4	-	-	-	0.02	0.06	-
6_3	2.3	46.28	14.70	7.59	76.49	41.13	31.18
6_4	3.2	3.56	0.77	0.27	1.52	1.45	2.38
7_3	2.4	-	-	-	0.02	0.01	+
7_4	3.3	0.59	2.98	0.05	0.73	2.62	0.86
Total Percent		100.00	100.00	100.00	100.00	100.00	100.00

(Data Source: 4)

APPENDIX TABLE 27. Age composition of red salmon catch and escapement combined, Ugashik district, 1963-68.

Age Class		Percent by Year and Age Class					
		1963	1964	1965	1966	1967	1968
3_2	1.1	-	0.04	0.02	-	0.10	0.01
4_1	0.3	-	0.03	0.11	0.11	-	0.12
4_2	1.2	2.63	61.37	11.06	6.01	2.97	17.30
4_3	2.1	-	1.00	0.11	0.16	0.03	5.71
5_2	1.3	15.42	3.35	11.55	37.74	28.68	11.32
5_3	2.2	66.47	28.21	71.99	19.13	41.46	50.32
6_2	1.4	0.28	-	0.01	0.02	0.23	0.03
6_3	2.3	14.67	5.84	5.15	36.76	26.37	14.94
6_4	3.2	0.53	-	-	0.03	0.03	0.13
7_3	2.4	-	-	-	-	0.06	0.05
7_4	3.3	-	0.16	-	0.04	0.07	0.07
Total Percent		100.00	100.00	100.00	100.00	100.00	100.00

(Data Source: 4)

APPENDIX TABLE 28. Age composition of red salmon catch and escapement combined, Nushagak district, 1963-68.

Age Class		Percent by Year and Age Class					
		1963	1964	1965	1966	1967	1968
3_1	0.2	0.25	0.09	0.03	0.01	0.11	0.17
3_2	1.1	0.34	-	0.08	-	0.04	0.06
4_1	0.3	3.38	1.25	1.93	0.38	1.84	1.03
4_2	1.2	53.78	59.11	15.65	32.98	47.38	31.08
4_3	2.1	0.50	0.01	-	0.05	0.06	0.03
5_1	0.4	-	0.01	-	0.03	0.10	0.06
5_2	1.3	34.89	21.00	70.52	59.46	40.73	58.92
5_3	2.2	5.91	16.10	8.24	1.50	7.44	5.61
5_4	3.1	-	-	-	-	-	+
6_2	1.4	-	-	0.03	0.08	0.14	0.34
6_3	2.3	0.95	2.43	3.52	5.44	2.16	2.64
6_4	3.2	+	-	-	0.02	-	-
7_3	2.4	+	-	-	-	-	0.02
7_4	3.3	-	-	-	0.05	-	0.04
Total Percent		100.00	100.00	100.00	100.00	100.00	100.00

(Data Source: 4)

APPENDIX TABLE 29. Age composition of red salmon catch and escapement combined, Togiak district, 1963-68.

Age Class		Percent by Year and Age Class					
		1963	1964	1965	1966	1967	1968
3_1	0.2	-	0.24	-	-	0.06	0.12
3_2	1.1	-	0.01	-	-	0.06	0.07
4_1	0.3	0.09	0.66	0.75	2.03	1.05	0.81
4_2	1.2	40.21	52.06	24.76	14.37	24.01	31.60
4_3	2.1	-	-	-	-	0.01	-
5_1	0.4	-	-	-	0.01	0.06	-
5_2	1.3	32.20	24.90	66.41	63.90	59.76	47.78
5_3	2.2	16.87	15.43	6.36	4.55	2.85	13.57
6_2	1.4	-	-	-	0.07	0.40	0.08
6_3	2.3	10.16	6.70	1.72	15.04	11.65	5.94
6_4	3.2	0.38	-	-	-	-	-
7_3	2.4	-	-	-	-	0.08	-
7_4	3.3	0.09	-	-	0.03	0.01	0.03
Total Percent		100.00	100.00	100.00	100.00	100.00	100.00

(Data Source: 4)

APPENDIX TABLE 30. Age composition of red salmon catch and escapement combined, Bristol Bay, 1963-68.

Age Class		Percent by Year and Age Class					
		1963	1964	1965	1966	1967	1968
3_1	0.2	0.07	0.04	+	+	0.02	0.04
3_2	1.1	0.12	0.10	0.04	-	0.15	0.44
4_1	0.3	0.93	0.35	0.08	0.11	0.30	0.24
4_2	1.2	28.41	51.19	2.35	7.61	11.06	38.20
4_3	2.1	0.27	1.57	0.01	0.05	0.14	1.72
5_1	0.4	-	+	-	0.01	0.02	0.01
5_2	1.3	16.62	14.08	5.75	19.82	12.91	20.94
5_3	2.2	27.14	25.76	89.63	17.14	54.84	23.98
5_4	3.1	0.10	0.01	-	-	-	0.01
6_2	1.4	0.05	0.01	+	0.02	0.08	0.10
6_3	2.3	25.12	6.13	2.11	54.79	19.67	13.53
6_4	3.2	1.01	0.17	0.02	0.31	0.29	0.57
7_3	2.4	+	-	-	-	0.01	0.01
7_4	3.3	0.16	0.59	0.01	0.14	0.51	0.21
Total Percent		100.00	100.00	100.00	100.00	100.00	100.00

(Data Source: 4)

APPENDIX TABLE 31. Comparative Kvichak River red salmon smolt outmigration, 1955-68.

Year of Seaward Migration	Age I		Age II		24-Hour[1/] Index Points	Index Net Catch
	Percent	Mean Length in mm	Percent	Mean Length in mm		
1955	7.3	89.0	92.7	109.0	7.8	259,978
1956	39.2	92.0	60.8	116.0	2.3	77,660
1957	72.3	96.0	27.7	120.0	0.9	30,907
1958	97.9	84.0	2.1	114.0	100.0	3,333,953
1959	2.9	80.0	97.1	99.0	85.9	2,863,876
1960	10.0	91.0	90.0	108.0	18.4	614,003
1961	72.2	91.8	27.8	117.2	1.1	36,164
1962	94.0	82.0	6.0	110.0	36.1	1,203,000
1963	2.7	83.3	97.3	98.3	126.9	4,229,431
1964	22.0	87.0	78.0	108.0	61.8	2,061,586
1965	3.6	90.0	96.4	108,9	54.4	1,812,555
1966	91.0	94.0	9.0	114.0	8.3	275,761
1967	92.8	86.4	7.2	118.3	92.6	3,088,742
1968	10.6	87.9	89.4	104.5	183.7	6,123,683
Average	44.2	88.2	55.8	110.4	49.3	1,857,950

1/ One index point = 33,340 smolts.

(Data Sources: 1 and 5)

APPENDIX TABLE 32. Comparative Naknek River red salmon smolt outmigration, 1956-68.

Year of Seaward Migration	Age I		Age II		Outmigration Estimate
	Percent	Mean Length in mm	Percent	Mean Length in mm	
1956	84.4	94.0	15.6	103.0	6,000,000
1957	57.9	111.0	42.1	112.0	3,040,416
1958	96.4	91.0	3.6	114.0	10,060,200
1959	80.5	97.0	19.5	106.0	12,465,487
1960	53.1	99.0	46.6	109.0	6,691,377
1961	77.8	103.0	22.2	113.0	5,612,647
1962	48.6	105.0	51.4	112.0	16,462,216
1963	40.6	98.0	58.5	114.0	14,900,855
1964	31.1	97.0	68.8	110.0	7,228,339
1965	59.6	99.0	40.0	114.0	24,708,672
1966	33.8	101.0	66.2	112.0	9,212,910
1967	43.5	113.0	56.2	119.0	9,407,200
1968	41.2	99.0	56.7	108.0	18,596,039
Average	57.6 1/	100.5	42.1 1/	111.2	11,106,643

1/ Age III smolt amounted to 0.3% in 1960; 0.9% in 1963; 0.1% in 1964; 0.4% in 1965; 0.3% in 1967; 2.1% in 1968.

(Data Sources: 1 and 11)

APPENDIX TABLE 33. Comparative Ugashik River red salmon smolt outmigration, 1956-68.

Year of Seaward Migration	Age I		Age II		Index[2] Points	Index[3] Net Catch	Outmigration Estimate
	Percent	Mean Length in mm	Percent	Mean Length in mm			
1956	11.0	-	89.0	-	-	-	-
1957	4.0	-	96.0	-	-	-	-
1958[1]	98.1	93.0	1.9	112.0	100.0	301,232	11,659,905
1959	87.3	90.0	12.7	120.0	36.5	109,982	2,887,002
1960	59.7	90.0	39.3	108.0	75.1	226,317	5,503,646
1961	20.4	90.0	79.6	112.0	52.3	157,441	3,802,079
1962	80.7	88.0	19.3	112.0	103.1	310,616	16,692,089
1963	46.3	89.8	53.7	104.3	305.2	919,451	33,750,496
1964	80.1	92.2	19.8	118.3	68.1	205,145	9,990,048
1965	28.8	93.7	71.2	114.1	57.4	172,893	3,640,115
1966	-	-	-	-	-	-	-
1967	52.5	87.5	47.5	113.1	30.9	93,068	5,137,063
1968	93.1	92.8	6.9	112.6	145.9	439,587	42,205,912
Average	55.2[4]	90.7	44.7[4]	112.6	97.5	293,573	13,526,836

1/ Base year: assigned value of 100.0.
2/ One index point = 3,012.32 smolts.
3/ Three-hour index period, 10 p.m. to 1 a.m.
4/ 1.0 percent Age III in 1960; 0.1 percent Age III in 1963 and 1964.
(Data Sources: 1 and 11)

APPENDIX TABLE 34. Comparative subsistence catch of salmon for Bristol Bay by district and species, 1963-68.[1/]

Year	Catch by Species					
	Reds	Kings	Chums	Pinks	Cohos	Total
			NAKNEK-KVICHAK DISTRICT			
1963	33,600	700	100	0	500	34,900
1964	69,100	800	100	1,500	1,400	72,900
1965	67,400	800	100	100	400	68,800
1966	71,500	700	400	3,500	600	76,700
1967	66,600	700	100	300	800	68,500
1968	67,100	500	100	300	200	68,200
Total	375,300	4,200	900	5,700	3,900	390,000
6-Year Average	62,550	700	150	950	650	65,000
			NUSHAGAK DISTRICT			
1963	41,200	3,600	8,500	+	3,900	57,200
1964	31,800	2,900	8,700	4,100	4,900	52,400
1965	47,500	4,600	18,400	200	5,400	76,100
1966	23,600	3,700	6,000	4,900	2,400	40,600
1967	34,900	3,700	14,000	800	4,000	57,400
1968	30,000	6,600	8,600	5,800	1,900	52,900
Total	209,000	25,100	64,200	15,800	22,500	336,600
6-Year Average	34,830	4,180	10,700	2,630	3,750	56,100

1/ Subsistence fishing is insignificant in the Egegik and Ugashik districts of Bristol Bay, while preliminary data indicates that the Togiak district catches fall in the range of 10-20,000 salmon.

(Data Source: 1)